American Gas Association MONTHLY

An Industry Research Program

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Progress in Appliance Safety

•

Emergency Price Control Act

•

A Revolution in Gas Heating

•

Post-War Gas Industry Needs

December 1943

VOLUME XXV NUMBER 12

"...and I dreamed that dinner came floating in without my moving a finger..."

ISN'T IT FUN to dream about a house where most of the dreary work is done by magic?

Well, keep on dreaming . . . for tomorrow many of your wishes are *coming true!*

You'll have a *Certified Performance* Gas range so wonderful it will be like having a chef in the kitchen . . . a Gas refrigerator that keeps foods fresh so long it will save hours of marketing and meal preparation . . . a heating unit that *cools* your home as well as heats it—without a thought from you . . . and oceans of hot water to make *everything* easier!

All this, and more too, will be possible through the miracle of the blue Gas flame—*the flame that cools as well as heats!*

In the laboratories of the Gas industry, engineers are now developing these wonders... making them possible for every type of home.

Today Gas speeds war production. Use it wisely. But tomorrow it will make your dream of more comfortable, *economical* living a reality. It's a dream worth saving for—with every War Bond you can buy.

THE FLAME THAT WILL BRIGHTEN YOUR FUTURE

GAS

An advertisement of the American Gas Association

American Gas Association MONTHLY

CONTENTS FOR DECEMBER 1943

Reports from those who attended the Annual Meeting confirm the conviction that it was a bell-ringer and well worthy of its billing as a "wartime working assemblage." . . . That the industry's eyes are riveted on post-war potentialities is well known but not so well known is the fact that its feet are firmly grounded in a vastly accelerated research program. Mr. Sperry tells the story convincingly. . . . An impressive summary of the revolution in industrial heating by Mr. Hess lends further substance to the gas industry's optimistic outlook without minimizing the problems. . . . There are also hurdles to be taken in the domestic gas field, Mr. Reed points out in a comprehensive analysis calling for straight thinking. Mr. Smith continues the post-war roundtable with an eloquent dissertation on the need for more national advertising and better selling technique. . . . Getting back to wartime regulation, the outstanding feature of this issue is Mr. Strait's valuable review of OPA price control measures. The new Rate Committee chairman has done a scholarly job. . . . Then there is Mr. Hightower's statement, buttressed by facts, that you have as much chance of being hit by lightning as being a gas casualty.

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THE GAS INDUSTRY IN BRITAIN—Another of a series of striking photographs taken by the British Council. This picture shows gas being analyzed in the laboratories—a daily operation to make certain that a recognized quality is maintained.

American Gas Association MONTHLY

JAMES M. BEALL, *Editor*

RESEARCH
. . . An Industry Program for Today and Tomorrow

By MARCY L. SPERRY

President, Washington Gas Light Co., Washington, D. C.

GAS Industry Research—Today and Tomorrow—is a very broad subject in anyone's language, of vital importance to our industry, and to every person in it. We are all influenced by every forward step taken as the result of research.

The desire for research springs from a normal healthy dissatisfaction with things as they are. Fundamental research is the endeavor to find new and better basic ways of doing things. Applied research is translating the results of fundamental research into practical use.

While we are primarily here giving our careful, intelligent attention to research of today and tomorrow, in order to envisage this subject in its broad aspects, let us remember briefly from past records the extent to which our industry has advanced in the last twenty-five years because of the organized research which it has done itself, as well as that done by our member companies, individually.

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The research which has been done under the sponsorship of the American Gas Association has been governed by the needs of the industry as a whole, and the selection of the individual research projects is related to such needs. The Association's activities have been in the several fields of production, transmission, distribution and utilization. The results of this research have been used extensively throughout the industry. The list is long, covering coal carbonization, the control of gummy deposits, the mixing of different gases, studies of soil corrosion and protective pipe coating, natural gas well deliveries and pipe line flow—to mention but a few of such projects.

Of our past research accomplishments we are proud but, with due regard for the value of history, let us now look at our Association's present research program which is an extensive one. Some may deem it too extensive, others too meager. The position of our industry, one year or ten years from now, will record the answer.

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Production and Distribution

In the fields of production and distribution, our research engineers are continuing their earlier work on the removal of organic sulphur compounds from gas; and microbiological anerobic corrosion, as it affects pipe protection, is being investigated. Mixed gas research, particularly as applied to high B.t.u. mixtures, is being further studied. Methods of controlling and gauging combination oil and gas wells to prevent extensive gas waste are under investigation, as well as studies of the formation and effect of hydrocarbon hydrates, particularly as they affect the freezing of natural gas lines. All of these projects involve matters which are fundamental to our business being directed toward the solution of problems of long standing.

UTILIZATION

General

It is in the field of gas utilization that we come directly into intensive competition for the customers' dollar by other fuels and sources of energy. This competition was becoming of great importance before this era of necessary War Production Board limitation orders. When such orders are no longer in effect, the old competitive problems of past years will then seem to us as child's play. Therefore, without minimizing the necessity and importance of other research investigations, it does appear sound to place all emphasis possible, in our research, on greatly advancing and improving our methods of gas utilization.

Address before American Gas Association Annual Meeting, St. Louis, Mo., Oct. 26-28, 1943.

The utilization of heat energy in American homes, places of business and in industrial establishments covers a vast market of greatly different characteristics. The local problems requiring research in varying degrees are innumerable. Obviously it is impracticable for this Association or any other single body to be the sole research agency. Your Association, therefore, in its present research plans, is to the best of its ability selecting projects of value to the entire industry and those which would probably not be undertaken by individual members, the selections being made only after careful study by Committees thoroughly representative of our industry.

Industrial and Commercial

The utilization of heat energy in the industrial and commercial field involves many separate and distinct uses of gas which differ from each other in the task to be performed, the equipment used and in the processes applied. No matter whether market trends are unfavorable or the reverse organized research enables us to develop answers which permit us to improve the marketability of our product.

To illustrate. Included in the 48 industrial and commercial research projects, which have been sponsored by your Association in the last ten years, was one which finally resulted in the development of radiant tube enameling furnaces, and enabled our industry to greatly increase its sale of gas for use in such furnaces when the tendency was for such sales to decrease. Further, the successful development of the equipment used and the technique required for direct firing in high temperature bisque applications in the clay products division of ceramics has made available another great opportunity for the use of gas that otherwise would not exist.

We cannot but profoundly admire the resourcefulness of those in our industry who sponsor and conduct industrial research. There you have a perfect team with a group of manufacturers and industrial utility engineers on the one hand and a central industry committee—the clearing house—on the other. Industrial gas research progress seems to be as rapid as the evolution of American technology! Thus was our industry able to meet the challenge of the Axis Powers. New industrial gas processes and arts, springing from research and occasioned by the war were developed and applied—almost overnight. You all have heard about gas heat-treating of aluminum, magnesium and of innumerable other novel applications introduced because of the requirements of our armed forces.

Summer Air Conditioning

The research sponsored by our Association has been an important factor in the development and improvement of gas air conditioning equipment in the comfort field. The manufacturers of such equipment, and those in charge of research investigation in this field, are working closely together and thus have traveled through the long, hard initial period of exploration and investigation with such success that when normal manufacturing and selling may again be undertaken, our industry has every expectation of successfully serving a large number of customers with summer air conditioning.

Domestic Cooking

With respect to the research work being done in the domestic cooking field, in which we are all so much interested, it includes oven heat distribution to secure more perfect baking and economy of operation; the investigation of oven heat losses by conduction and radiation, both through the flues and around doors; aeration; adequacy of controls, etc. Research on broilers includes studies of changing input rates; effect of various types of flames; studies of the effect of temperatures on broiling—all to secure the perfect broiling device. Pre-heating time has been studied and ways for improvement developed. The subject of smokeless broiling, aeration and ventilation have all been studied and are, likewise, receiving careful attention.

Automatic ignition research, not only for top burners, but also for ovens and broilers, is now well under way and some entirely original engineering data have just been released, which can well serve as the basis for further improvement in flash tube ignition and the elimination of separate pilots.

Range top sections have received close study and ways have been indicated for increasing efficiencies. Valuable studies have been completed on the effect of varied input rates on top section performance and the effect of varied input rates on utensils of varying sizes. Speed of cooking is receiving the close attention it deserves.

Studies of range burner design and performance have been completed and reported on, and for the first time, we now have a complete study, recently published, dealing with ignition and the extinction characteristics of range top burners.

Domestic Water Heating

In the gas water heater field the overall efficiency is directly affected by heat losses. This subject has and is being studied from the angle of losses through external surfaces and piping, and standby losses through flues. New technical data on combustion chambers and flueways of gas storage water heaters, of real value to designers, is now in possession of all manufacturers as the result of this research project. Valuable data on the effect of cold water inlet temperature on the combustion and operation of water heaters have just been published, and important studies on maximum hot water delivery have been completed.

Future

Now with respect to the future in gas utilization—Drastic improvements in appliances other than in appearance and convenience gadgets are definitely linked to and limited by *fundamentals*. Present adaptations of combustion in domestic gas appliances, accepted as conventional, have been developed from presently known technical data, basic principles and formulae. Such technical data, basic principles and formulae are the *fundamentals* from which structural design has been built up. If we are satisfied with the present level of such fundamentals then we shall probably have to remain satisfied to continue to have appliances about as we now know them. But we are not satisfied. No one is. As fundamentals advance, each step in that advance will be accompanied by many other potential benefits in design and construction. The objective of this Association in its domestic gas research program is to so advance fundamental technical data and fundamental

Plans for gas research in the making—Members and guests of the Committee on Domestic Gas Research at a meeting in St. Louis during the A. G. A. Annual Meeting in October. Left to right—O. H. Ritenour, Washington; Jesse L. Johnson, Providence; R. M. Conner, Cleveland; Wesley F. Wright, Dallas; F. M. Banks, Los Angeles, vice-chairman; C. E. Bennett, Pittsburgh; E. J. Boothby, Washington, chairman; Marcy L. Sperry, Washington; E. D. Milener, New York, secretary; Charles H. Wiley, St. Louis; W. R. Teller, Cleveland; J. J. Quinn, Boston

knowledge that the shackles that hold back engineering, design and construction be broken. The domestic gas program is the largest one of the Association in research. It is well that it is.

Our research work to date in the domestic gas field, deals with endeavors, step by step, to improve the functioning of appliances which have been used until now. We must be careful in this slow, patient effort to improve these so-called conventional applications, that the applications themselves do not become obsolete, thus rendering the improvements behind the times and, therefore, obsolete as well.

New Conception of Gas

Individuals in our industry have felt the need, and have been asking for, some new conception of the application of gas heat in the domestic field, and rightfully so. To meet this need, the Domestic Gas Research Committee at its meeting here last Monday, decided to devote even more attention than in the past to this subject and to accelerate one item, which has as yet been explored only in a preliminary way.

This involves the development of principles from which burners can be developed to permit the injection of all air for combustion as 100% primary air. It encompasses burners, not only on ranges, but on all other appliances as well. Therefore, if this particular research investigation is productive of the desired results, the beneficial effect will be universal on all domestic appliances. Whether the idea will become an accomplished fact remains for the future to determine, but, at any rate, the work is underway. If the project proves possible of accomplishment, practically all present technical designs will become obsolete and a new day will dawn upon us in the realm of gas appliance performance. This development should give us a greater intensity of flame, greater speed and efficiency.

"Pre-mixed" Combustion

Let us proceed a step further. In the field of industrial application, "pre-mixed" combustion has already proven highly successful. This principle should also be applicable to the field of domestic gas utilization. While there may be some difficulties in the initial period of use of domestic appliances incorporating the "pre-mixed" principle, think of the headaches and limitations which would ultimately be eliminated. No more carbon monoxide generated from impingement. No more adjustments of individual burners. Universal burners (interchangeable) for all gases. Elimination of air shutters, heavy venturi tubes, ventilation bowls and recessed grates. This improvement would give us clean range cooking tops and burner compartments, double the cooking speed and generally increase efficiencies and capacities, resulting in cooler kitchens and numerous other advantages.

Here is something about which to be really enthusiastic. To some it may sound radical. Well, remember that it may be radically right as well as radically wrong. We, in the gas industry, choose to believe that our technical advances are radically right because they are based on sound, scientific research. But it is bold research not afraid to tackle difficult subjects; not afraid to start all over again and again when a particular investigation is nonproductive. Let us continue to have bold, intelligent research with strong Association planning and thinking to back it.

Responsibilities of Utilities and Manufacturers

Our gas utility industry has control of its economies in the production, transmission and distribution of gas. Much attention has been paid to these three phases of our business and no apologies have to be made for the technical progress made therein. With respect to the promotion and sale of its product, the industry has a fair record in recent years. It keenly feels its responsibility to promote the use of its product, yet it does not manufacture a single device in which its product is utilized.

The nearest parallel to our industry in these United States of America is the electric industry. To some degree, it shares the peculiarity just mentioned. Yet, the electric utility industry is more fortunate than we are because the principal manufacturers of electrical appliances are, in themselves, big industries. Furthermore, the major electrical appliance manufacturers are

not only engaged in the development, production and sale of appliances, but also are designers and manufacturers of electrical generating, distribution and lighting equipment. Accordingly, their incentive is twofold, the greater the success in their appliance business, the greater becomes the need for their generating and distribution equipment. The number, size and nature of these manufacturers is such that there is endless incentive for research and development on their part with substantial resources with which to carry it on.

Were the manufacturers of gas appliances, similar in size and organization to those in the electrical industry, there might then be no need for our industry to sponsor and carry on centralized basic or fundamental research in either the domestic or the industrial fields. On the other hand, the utilization of gas does introduce complications. Therefore, regardless of how the gas appliance manufacturers are organized and regardless of their size, it may always be essential for our industry to make available to the manufacturers, basic and fundamental data on the utilization of gas, as an aid to them in carrying on appliance development work. Without having such technical data available, appliance development and design becomes a cut and try operation. Heaven forbid that we ever have to depend for our progress on such methods. We all know full well that the advancement made by an individual business or industry can most frequently be best measured by the amount of intelligent, efficient research in which it engages.

Only as our gas utility business grows in size and strength can the manufacturers expect to do likewise. On the other hand, only as the gas appliance manufacturers successfully make available to and sell to the public the product of their factories, can we gas utilities be successful. Our interests and those of the manufacturers are irrevocably interlinked and this basic fact must be remembered if both are to successfully remain in business.

Never has there been a time when there has been greater need for unity; first, within the gas utility group; second, within the gas appliance manufacturers group and third, between them both.

Some of us in the industry may not be inclined to appreciate the problems and viewpoint of the manufacturers, and for that reason make it "tough" for them. On the other hand, it may be that certain manufacturers feel that because part, or all of their outlets are through channels other than the gas utilities, they become quite independent of our industry. But they should not forget that insofar as their gas appliance business is concerned, their interests, regardless of their selling outlets, are closely interlinked with the interests of the gas utilities. There is a community of interest from which neither the utilities nor the manufacturers can divorce themselves.

The gas utility business, through its Association, has recognized its part of this obligation and currently has appropriated over one-fourth of this year's Association's gross income for domestic gas research. This appropriation follows an expenditure in the last Association year of an amount nearly as great. From this accelerated rate of doing fundamental research, published results will shortly begin to flow in greater volume than ever before. A resolution adopted seven years ago by the Executive Board of the American Gas Association has confined the research done by our utility industry in the domestic field to basic or fundamental research.* Accordingly, the best that can now be expected from our Association's current domestic research activities, is the advancement of fundamentals which are to serve as the basis of appliance development work by manufacturers. Therefore, it is the responsibility and obligation of every manufacturer to follow closely the results of our fundamental research and to carry on from there, keeping in mind the community of interest previously referred to.

Conclusion

Let us eliminate all flag waving regarding research and think in terms of doing all that is necessary, and doing it intelligently, to find the hidden treasures to enable us to revise presently accepted data and conclusions and even disregard the old as newly discovered facts so warrant.

We trust you have confidence that the research now being planned and carried on by the A. G. A. Laboratories and other agencies where advisable, under the direction of your Association's committees, is a forceful and intelligent move to solve our problems.

With a united and coordinated industry—manufacturers and utilities—building its future on a sound foundation of research and progressive management, we can look forward to the progress of our business with courage and confidence.

* The Executive Board at its meeting in St. Louis, October 26, adopted a new resolution redefining the Association's research policy. This resolution was published on page 452 of the November A. G. A. MONTHLY.

Easton Plant Restores Gas Service

EARLY in the morning of Sunday, October 24, an explosion of undetermined origin occurred at the gas plant of the Metropolitan Edison Company, in Easton, Pa. In a matter of seconds a large brick building was completely demolished, burying badly damaged machinery under a mass of rubble and twisted steel in which fire raged for several hours following the blast.

The Easton disaster became "front page news" in practically every newspaper in the United States. To the gas industry, however, the incident of the explosion will probably be of far less interest than the remarkable record which was achieved in the restoration of service to 18,000 customers.

Twelve days after the explosion the company started turning on valves on service lines in low-pressure areas. The achievement was hailed with delight by customers who had estimated that the period of gas service interruption would be as long as three months. Mayors of the two largest communities served, Easton, Pa. and Phillipsburg, N. J., were at the plant to congratulate company officials when gas was again turned into the mains.

What amounted to practically rebuilding a gas plant in a period of less than two weeks was accomplished by working on a 24-hour schedule, by having available the facilities of large machine shops, including that of the Ingersoll-Rand Co., and by developing a determination in engineers and workmen to restore service in the shortest possible time.

With the cooperation of the local newspaper, customers were kept informed of the day-by-day progress of the work and they were delighted when the company beat by a day the date on which it had been announced, in news story and advertisement, that gas service would be restored.

Progress in Safety ... *Health and Welfare Protected by Appliance Testing Program*

By CECIL L. HIGHTOWER*

Chairman, Accident Prevention Committee, American Gas Association

Cecil L. Hightower

THE gas industry, like other great industries supplying services essential to the health and welfare of the American public, is vitally interested in the promotion of safety in the home.

Gas is a safe fuel as shown by its daily use in the hands of more than 18½ million customers. Such hazards as are inherent in the use of a gaseous fuel have been minimized through years of continuous improvement of appliances and service by the gas companies as well as manufacturers. Since 1925, a new impetus has been given to gas appliance safety through the adoption of the American Gas Association Laboratories' testing program, leading to the approval and certification of gas appliances and accessories under the auspices of the American Standards Association Requirements.

Manufacturers' Role

The gas appliance manufacturers have played a significant role in this story for they have cooperated wholeheartedly with the principle of a national testing agency administered by the gas industry to see that appliances are safe. In fact, they have spent more than 4 million dollars in testing and inspection fees alone to comply with national requirements for safety, not counting the cost to them to redesign equipment to meet the required standards.

The American Gas Association Testing Laboratories were established in 1925, and began their work with testing of gas ranges. Today, these laboratories are the largest and best-equipped of their kind in the world. Located conveniently at Cleveland and Los Angeles, they have been actively engaged in the testing and development of gas appliances with the result that unsafe and improperly designed gas equipment has practically been eliminated from the market. Today, more than 95% of all gas appliances produced and sold in the United States and Canada bear the Laboratories' Seal of Approval indicating that they have successfully passed hundreds of rigid tests based on safety but not omitting efficiency, durability, and construction. These activities have been an important factor in the creation of complete confidence of the consumer in gas and gas service.

The American Gas Association Laboratories Approval Requirements Committee includes representatives of the American Home Economics Association; U. S. Bureau of Home Economics; National Bureau of Standards; U. S. Bureau of Mines; U. S. Public Health Service; American Institute of Architects; Master Plumbers Association; National Association of Heating, Piping and Air Conditioning Contractors; Associated Factory Mutual Fire Insurance Companies, as well as other interested governmental agencies and national organizations and manufacturer and gas company members of the American Gas Association.

The requirements, after approval by the American Standards Association, are issued under the classification Z21. The Laboratories' Requirements Committee has also issued a number of "requirements" for the installation of gas equipment and accessories. Among these, the A.G.A. Requirements and Recommended Practice for House Piping and Appliance Installation is generally used as a basic code for the home use of gas. A practically identical publication has been issued by the National Fire Protection Association as Pamphlet No. 54 entitled "Recommended Good Practice Requirements of the National Board of Fire Underwriters for the Installation, Maintenance and Use of Piping and Fittings for City Gas."

Safety Results Impressive

The results of this extensive program are effectively demonstrated by the records of the Bureau of Census on accidental fatalities due to gas. These have been reduced during the period of the Laboratories' existence by more than 50% so that the danger of accidental fatality from gas is not much more than the chance of being hit by lightning.

In addition to the national testing laboratory, many gas utilities also have their own testing agencies for the purpose of making certain that the particular appliances which they plan to sell in their community are properly adapted for the local conditions which may be encountered due to the type of gas served, the existence of local ordinances, elevation above sea level, and certain other factors. Such gas company laboratories may enforce requirements above and beyond those which are nationally recognized as necessary.

In their efforts to safeguard the home, every gas company has a speedy system for the immediate handling of any gas leaks reported from the consumer premises. The operation of this system, using highly skilled men and most modern equipment, has been an important contributing factor in the prevention of accidents. The efficiency of gas

* Safety director, United Gas Pipe Line Company, Shreveport, La.

Address before National Safety Congress, Chicago, Illinois, October 7, 1943.

company service departments and the widespread employment of Home Service girls have emphasized the correct care and use of domestic gas equipment. These two have been effective in keeping home accidents at an absolute minimum.

Anyone not familiar with gas equipment might think of the various hazards connected with gas in about the following manner:

First in his mind would be the question of automatic gas appliances' failing due to the accidental blowing out of the gas pilot. In the past, this may have been important but it has been eliminated today. All automatic gas appliances are required to have effective devices which will prevent the escape of unburned gas. These generally take the form of safety pilots which may be mechanical or electrical in their operation. They operate within approved, narrow-time limits in the event of the pilot flame failure, whatever the cause may be.

A second popular type of hazard has, in the past, been frequently noted in the daily newpapers when a pot of coffee boiled over while someone fell asleep. Many gas ranges built since about 1935 have been provided with automatic top-flash lighters. These will light any top burner just as soon as the gas cock is turned on, and if the gas flame is extinguished by boiling over, it will instantly relight from the flash pilot. Moreover, many of the modern burner types are so designed that boiling over will not affect them nor can they be extinguished by draft from an open door or window.

Insurance companies have sometimes published pictures of the disastrous results of domestic hot water boiler explosions due to uncontrolled overheating by a coal fire. The gas industry is fortunate in having an excellent record in this connection, since the flexible control of gas by means of a thermostat has effectively prevented such trouble. Furthermore, the increase in use of temperature relief valves has overcome the possibility that the thermostat might, in some way, become inoperative.

Hazards from gas leaking from house piping are considered practically non-existent today. There is adequate control over this matter by the larger municipalities in the program of licensing plumbers and gas fitters and by gas companies, in any event, because every utility in the United States has rigid rules regarding the manner in which gas may be turned on by their fitters at the meter.

It may also be of interest to examine the fire record of gas because, contrary to casual thought, gas ranks low as a fire cause. The 1941 list of fire causes published by The National Fire Protection Association shows that gas and gas appliances were twenty-fifth out of a list of twenty-nine principal causes and were responsible for 3500 fires resulting in a cost of $1,250,000 out of a total of 736,000 fires with total damages of $325,000,000.

Alert to its wartime responsibilities to the public, the gas industry has prepared specific data and information not only for the protection of gas utility plants and personnel but for the general public as well. You are probably familiar with the releases which have been made advising the general public what to do in the event of an air raid, but you may not be familiar with the detailed instructions which have been issued to all Air Raid Wardens through the Office of Civilian Defense. This information, based on authentic experiences under actual wartime conditions in several of the European nations, gives assurance that the gas industry will continue to live up to its safety record even if we should be subject to the terrible destruction of attack from above.

Fortunately, air raids on this country seem unlikely at this moment, and it may, therefore, be more appropriate to mention what the gas industry has done to keep gas equipment serviceable throughout the duration. The industry recognized this problem very promptly and has taken a number of practical steps ranging from physical repair to the wide distribution of booklets like "Uncle Sam Wants It To Last" and "Keep 'em Cooking" covering hotel and restaurant equipment.

For the future, the gas industry is continuing to stress safe appliances and safe installation through a threefold program involving the manufacturers, the utility companies, and the Testing Laboratories. Each year requirements are made more stringent and more comprehensive with the end in view that accidents must be prevented at all costs.

Gas Ads from Home and Abroad

GAS FURNACE TO GUN

Every shell hurled at the enemy is a precision made tool of war requiring a number of heat processing operations in its manufacture. THE GAS FURNACE (inset above) is widely used by industry for this production job. GAS FUEL — the same fuel you use in your home for cooking — provides heat for annealing *cartridge cases*, and for forging, tapering and heat treating *projectiles*. GAS is clean, quick, automatic and easy to control in regulating furnace temperatures and atmospheres.

GAS is an important WAR FUEL — Be Not Wasteful In Your Home!

PUBLIC SERVICE

War factories depend on gas for many vital processes. Every therm you save at home means more power for war needs. 10,000 cubic feet of gas, for instance, can harden the tracks of a tank. You can help to find the extra gas required by using less gas at home.

Today's Gas-Saving Hints

The flame-tip is the hottest part of the gas. See that it just touches the bottom of the kettle. A flare round the sides is wasteful.

Turn down the gas when the pan boils. A smaller flame will keep it boiling.

Never boil a quart of water when only a pint is needed.

Open the "Frig" door as seldom as possible.

Don't wash under running hot-water tap.

Today's advertising in Britain and America is strikingly similar in theme and objective. The advertisement on the left is from the current series of the Public Service Electric and Gas Co., while the other copy was prepared by the British Commercial Gas Association

The Emergency Price Control Act of 1942 —Its Bearing on Public Utilities

By E. N. STRAIT

Chairman, Rate Committee, American Gas Association; Manager, Rate and Research Division, Public Utility Engineering and Service Corporation

ALTHOUGH, initially, the Emergency Price Control Act of 1942 had very little bearing on the public utility industry, and even now, in its amended form, has only a limited relationship, the developments in connection with the administration of the law have raised serious regulatory problems in the case of certain utilities. How far-reaching the effect of this may be cannot be foreseen before final judicial review of questions that have been raised; but now, after a year of operation under the amended Act, it may be well to review the general status of the emergency price control as it appears in relation to public utilities.

Scope of the Act in Relation to Public Utility Rates

On January 30, 1942, the Congress of the United States passed and the President approved the Emergency Price Control Act "to further the national defense and security by checking speculation and excessive price rises, price dislocations, and inflationary tendencies, ..." The Act, as then passed, provided for the regulation of prices of commodities, rents and certain services. The services of common carriers and other public utilities were specifically excluded.

Later, the Congress passed and the President approved on October 2, 1942, an amendment to the Emergency Price Control Act, the purpose of which was to broaden its scope, particularly by bringing the control of wages and salaries under it, and in general to strengthen the effort for national economic stabilization. That amendment also omitted the services of public utilities from the matters to be controlled by the Act but it did provide "that no common carrier or other public utility shall make any general increase in its rates or charges which were in effect September 15, 1942, unless it first gives 30 days' notice to the President, or such agencies as he may designate and consents to the timely intervention of such agency before the federal, state or municipal authority having jurisdiction to consider such increase."

This omission of common carriers and other public utilities from price control under the Act as amended was due, very evidently, to the existing general and adequate regulation of their rates by other governmental agencies, a situation which, even before the passage of this Act, did not, in the case of public utilities, allow speculation and excessive price rises, price dislocations and unauthorized inflationary tendencies to occur. The granting of authority to the President or his designated agency to intervene in rate cases involving increases in rates and charges was apparently, according to the history of the legislation, a compromise to give the agency of the President an opportunity to express itself on speculation, excessive price rises, price dislocation and inflationary tendencies, in any case before a regulatory authority, in which a general increase in rates is involved.

Under an executive authorization, issued by the President October 3, 1942, the Director of Economic Stabilization transferred to the Office of Price Administration (OPA), administrative authority over prices of commodities and certain services and also the right to intervene in public utility cases involving general rate increases. In its Procedural Regulation No. 11, issued November 12, 1942, the OPA defined a general increase in rates or charges of a public utility as "any change in rates, fares, classifications, rules, regulations or practices which results in an increase in the charges. . . . ."

Later, through an interpretation issued by counsel of the OPA to its own representatives, the view was expressed that general increases, as comprehended by the Emergency Price Control Act, include "an increase in utility rates, even though made as the result of automatic adjustment clauses based on increased taxes, fuel costs and similar items . . . . even though the automatic adjustment provision in the utility company's contract may have been made before the Price Control Acts were enacted." A news release of the Office of War Information gave out this expression of views but not as a formal interpretation addressed to the utility industry and the public.

Few OPA Interventions

On the whole there have been relatively few public utility situations in which there has been occasion for the Office of Price Administration to act. This is due principally to the fact that there have not been many applications by the public utility industry for authority to establish general rate increases since the enactment of the Emergency Price Control Act. In the case of some actions taken by the Office of Price Administration in relation to the rates of public utilities, the utilities concerned have felt that the OPA exceeded the authority granted by the Act. Certain of these instances involved proceedings more or less initiated by the OPA itself to effect rate reductions rather than to prevent inflationary increases in rates. Others involved objections raised by the OPA against the operation of automatic rate adjustment clauses which had been approved by regulatory authorities and had become effective as parts of the utilities' rate schedules,

prior to enactment of the emergency price control law.

Public Utility Rate Cases Involving OPA

While not attempting to review all of the public utility cases for which the Office of Price Administration has been responsible or in which it has taken an interest, it is considered important to mention here, as examples of what has been taking place, several of the cases in which the OPA has taken an active part, as well as certain others which indicate its policy with respect to public utilities.

Washington Gas Light Company

One of the earliest and most important cases in which the Office of Price Administration concerned itself was one relating to the Washington Gas Light Company which operates in the District of Columbia. Under the operation of the Sliding Scale Arrangement ("Washington Plan") by which the rates have been adjusted at annual hearings since 1935, the application of the principles of the Plan for the 1942 hearing for the first time indicated an increase in the rates of the Washington Gas Light Company for the ensuing year. Counsel for the OPA was represented at the pre-hearing conference and at hearings in August and September, 1942, during which the Commission, by a 2 to 1 vote, declined to reconsider the basic principles of the Sliding Scale Plan as urged by the OPA.

This was prior to the enactment of the Amendment of the law, which gave the President's representative (OPA) the right to intervene in cases involving rate increases. On October 13, 1942, after the Amendment was passed, the Commission issued its order, providing for an annual increase of approximately $200,000, and at that time called to the attention of the Company the provision of the recently enacted amendment which required utilities to give the President's representative 30 days' notice of any intended increase in rates and to consent to his timely intervention in the proceedings. The Company, thereupon, gave this notice of the intended increase in rates and, upon petition of the OPA, the Commission reopened the case for the purpose of receiving "additional evidence relating to the inflationary effect, if any, of the increase in rates," granting intervention for such purpose. The Company consented to the intervention. The OPA then petitioned for intervention "without restriction as to the type of evidence to be presented or otherwise limiting the scope of further hearings."

In November, 1942, the Commission denied this OPA petition by a vote of 2 to 1. During the course of the hearing, the OPA had claimed not only the right to intervene but also to indicate to Commissions the bases to be considered in determining problems of rate increases, such as the proper basis of valuation, proper operating expenses, depreciation, and reasonable return, and the right to appeal. The Commission was not in accord with this view, and held that such matters were beyond the scope of the hearing, but encouraged the assistance of the OPA in analyzing the possible inflationary effect of the increase.

The case was appealed by the OPA, and in February, 1943, the U. S. District Court for the District of Columbia ruled that the Commission must "afford the President's representatives the opportunity to fully test the inflationary trend, if any, which the proposed increase in rates may portend, and that the Commission cooperate therein." The Court's opinion was somewhat indefinite as to the OPA's power to dictate Commission considerations but directed that the Commission's decision be set aside.

The decision of the District Court was appealed by the Company and the Commission, and on July 26, 1943, a majority of the U. S. Court of Appeals for the District of Columbia sustained the Commission's decision, holding that the Commission, not the OPA, had the right to decide the scope of the case, and finding that the Commission had adequately considered the arguments of the OPA.

Commenting on the legislative process by which the Emergency Price Control Act was enacted, the Court of Appeals said:

> "It clearly appears from their remarks that the senators understood that the opportunity afforded by the President's representative to intervene in a rate hearing did not confer upon him the power to participate in the decision or to control the proceeding, but merely the right to show that an increase in rates would tend to increase the cost of living and thereby impair the stabilizing effect of the government's price regulation, with the right of appeal where the Commission's action is reviewable by the courts." 50 PUR (NS) 33, 43.

In September, the Office of Price Administration asked the U. S. Court of Appeals to stay execution of its decision pending the OPA's petition to the Supreme Court of the United States for a writ of certiorari. Such petition of the OPA was filed and it was granted on November 8, 1943. The questions submitted by the OPA to the Court are as follows:

"1. Whether the Commission failed to accord the Director of Economic Stabilization and the Administrator of the Office of Price Administration their right to a full and fair hearing under the Act of October 2, 1942.

"2. Whether the Commission was under a duty, by virtue of its statutory responsibility to establish just and reasonable rates, and in view of the wartime economy and the national stabilization program, to refuse to grant a rate increase in the absence of a clear showing that an increase was necessary.

"3. Whether the Company, which on its own figures was earning a return of 5 per cent on a substantially undepreciated rate base after all Federal income and excess profits taxes, may be held to have made a clear showing that an increase in its rates was necessary.

"4. Whether the Commission erred in its treatment of various items of expense, especially (a) the allowance as an operating expense of certain wartime corporate income taxes; and (b) the allowance of depreciation expense on a basis conflicting with that approved in Federal Power Commission v. Natural Gas Pipeline Company. 315 U. S. 575."

The decision of the U. S. Supreme Court on these questions will have a most important bearing on vital issues concerning the relation of the Emergency Price Control Act of 1942 to the regulation of rates of public utilities.

The Detroit Edison Company

In the Detroit Edison Company case, the purpose of the Office of Price Administration was definitely to obtain a reduction in rates, not to prevent an increase, since no question concerning a rate increase had arisen.

In 1942, the City of Detroit, by informal action, asked The Detroit Edison Company to make a current refund to its customers and it was pointed out that, as this would reduce the Company's profits for the year, most of the reduction would be offset by a decrease in the Company's excess profits tax. The Company refused to take this action and on October 26, 1942, the City filed a petition with the Michigan Public Service Commission pointing out that the Company's excess profits for the year 1942 would amount to approximately $8,000,000 and requesting a rebate to customers through a heavy reduction in rates for the months of November and December, 1942, sufficient to reduce the Company's net income for 1942 to not more than $12,000,000. The City's petition also requested that, effective January 1, 1943, rates of the Company be reduced by approximately 25 per cent, this particular request being confined specifically to residential and farm rates. The Company objected on the ground that the Commission had no authority to make an order retroactive in effect, while the City contended otherwise and further pointed out that the U. S. Treasury would not object to the loss of taxes in that manner.

After a preliminary hearing, the Commission, by its decision of December 4, 1942, dismissed that part of the petition which related to the matter of refunds for 1942. The Commission said:

> "This Commission is a statutory body and possesses only such powers as are conferred upon it by statute. This Commission does not have the power to order an electrical utility to refund to its customers moneys collected; more especially, where the moneys collected are in accordance with a lawful schedule of rates for services rendered. The moneys so collected are the absolute property of the Company."

"It is the opinion of this Commission that in any rate case the past earnings of a Company are material only to the ex-

tent that they are reflective of the possible future earnings of the Company. This is in accord with the general idea that the fixing of rates is a legislative function. When this Commission fixes rates, it acts in a quasi legislative capacity and looks to the future. The Commission so acts because of its opinion that its statutory power to fix rates for an electrical utility is limited to the fixing of reasonable rates for the future; and because of its opinion that it is without the power to do by indirection a thing which it has no power to do directly." Michigan Public Service Commission, D-1722.

Upon its petition, the OPA was permitted to intervene in the matter of the rate reduction requested by the City and, following the President's "hold-the-line" order of April 8, 1943, announced that it would actively seek rate reductions to conform with the order. The OPA filed a brief supporting the position of the City, in which the OPA contended that the rates were inflationary because of excessive earnings. Referring to what was said on this subject in its petition the OPA said in its brief:

"In this petition we alleged that the reduction of prices where profits are excessive, is an integral part of the national policy of economic stabilization; that to allow the Company to include all its war and excess profits taxes in its operating expenses would be in conflict with the program of the Government to prevent inflation, to stabilize prices and to avoid increases in the cost of living, and that a reduction in electric rates to eliminate excessive profits would release pressures on commodity price ceilings, assist in stabilizing the cost of living, and promote the anti-inflation and price stabilization policy of the Federal Government."

On the eliminating of excess profits and reducing rates and on the relation thereof to "the National effort to keep down the cost of living," the OPA made the following assertion:

"In this case it is possible to lower the cost of living in this area by eliminating excess profits which result from the furnishing of a necessary service. Such a reduction will in part offset increases in the cost of living which have been unavoidable. Thus, in making a reduction in the cost of a necessary item in the cost of living the Commission is performing a vital service to the National effort to keep down the cost of living."

The OPA also contended that federal income taxes and excess profits taxes in excess of normal pre-war taxes should not be allowed as a part of operating expenses. Its brief contains the following argument on the tax question:

"The Company is seeking to have allowed as operating expenses all taxes, including all federal income taxes and excess profits taxes levied by Congress to meet the expense of the war. As was stated in our Petition it is our position that a utility is not entitled to include war taxes in its operating expenses—it is entitled to an allowance of no more than normal federal income taxes.

"In determining the amount of taxes that may be included as an operating expense, it becomes important to know what year's income tax rate reflects normal taxes and does not include any amount for war or emergency taxes. We submit that the highest tax rate prevailing in the years 1936 to 1939 must be used as the rate to represent normal.

"The revenue bills for 1940, 1941 and 1942 provided for successively higher tax rates in order to provide funds for carrying on the war. The reports of the Committee on Ways and Means of the House of Representatives relating to the Revenue Act of each of these years, clearly state the use to which the proceeds of these bills would be put."

Following a full review of the matter, the Michigan Public Service Commission, on July 17, 1943, denied the City's' petition, holding that the Commission was without power to disallow as operating expenses any taxes lawfully incurred, that the Company's earnings were not excessive, and that its rates for electric service were reasonable.

On the question of allowance of taxes, the Commission expressed the following views:

"Under the Federal income tax law, any industry can avoid taxes by making less money. However, a free exercise of this alternative would unquestionably lessen industrial activity. In order to avoid any part of the income tax, it is necessary for the revenue producer to give up a part of its income.

"Under the laws of the State of Michigan, a regulated utility is entitled to earn a fair return upon the present value of the property devoted by it to public service. Money that has been lawfully spent in rendering service constitutes no part of such a return. The dollar paid out for taxes is no more available as income and return than a dollar spent for labor or any other legitimate expense.

"We have repeatedly stressed the fact that we are a statutory body and possess only the power conferred upon us by statute. We know of no statute giving us the power to forbid a Company the right to charge as an operating expense any tax lawfully incurred by it. Likewise we know of no statute giving us the power to forbid such a Company the right to so charge any part of the tax so incurred to operating expenses.

"We, therefore, find that all taxes are a proper operating charge and they will be so considered in determining the income of the Company in this case." 50 PUR (NS) 1, 3.

Following its order in July dismissing the City's petition, the Commission issued a supplemental order, reserving jurisdiction to reopen the case to give possible retroactive effect to any "exemption from or reduction in Federal taxes to the year 1943."

The City of Detroit has applied to the Michigan Supreme Court for leave to appeal from the Commission's order and the application for review has been granted but, as of November 1, 1943, the hearing date had not been set. The OPA also applied to the Court for leave to appeal from the Commission's order or, alternatively, to intervene in the City's appeal.

The City's memorandum brief on the application for leave to appeal stated in part that ". . . . the sole legal question is whether or not war taxes, as distinguished from normal income and other normal levies, are chargeable as an operating cost. . . . . This is the first time, so far as we are able to ascertain, that this Honorable Court, or any other appellate or Supreme

E. N. Strait Heads Rate Committee

APPOINTMENT of E. N. Strait, of the Public Utility Engineering and Service Corporation, Chicago, as chairman of the Rate Committee of the American Gas Association has been announced by Ernest R. Acker, president of the Association. This is not the first time Mr. Strait has been head of this important activity as he was chairman of this group in 1934.

The Rate Committee is made up of rate and valuation experts who meet regularly to consider developments affecting utility rates and related matters. From time to time in the past, the committee has issued valuable reports on gas industry matters. As a long-time member of the committee and past chairman, Mr. Strait is well qualified to direct the Association's rate studies. He is also a member and vice-chairman of the Edison Electric Institute's Rate Research Committee.

Mr. Strait's experience in public regulation of utilities and in private business has extended to various classes of public utility service. He is a graduate of the University of Wisconsin with a B.S. degree in Engineering in 1906 and an Electrical Engineering degree in 1912. He has been connected with Public Utility Engineering and Service Corporation and its predecessor companies since 1916, during which time he has been in charge of rate and related matters.

He was previously identified with the Railroad Commission of Wisconsin (now Public Service Commission of Wisconsin) in various capacities such as valuation engineer, service inspector, case investigator and chief statistician of the Commission's utility department.

In addition to his A. G. A. and E. E. I. memberships, Mr. Strait is a member of the Western Society of Engineers and an associate member of the Illuminating Engineering Society and the American Institute of Electrical Engineers.

In 1942, Mr. Strait served for a time with the War Production Board as a fuel and power consultant.

Court, has been called upon to review proceedings where the Excess Profits Tax matter has been squarely presented as the sole issue for its consideration. . . . ."

Milwaukee Gas Light Company

Early in 1943, the Office of Price Administration initiated a complaint against the application of Milwaukee Gas Light Company's automatic fuel clause, applicable to gas service for space heating and based on the price of competitive fuel oil. The action of the OPA followed a notice given to it by the Company, which, however, denied the need of such notice. This fuel clause had been approved by the Public Service Commission of Wisconsin several years before. Three alternative courses of procedure were suggested to the Commission by the OPA. The Commission refused either to investigate the matter on its own motion or to order the Company to show cause why the charges under the fuel clause should not remain at their level of September 15, 1942, as suggested by the OPA, but the Commission adopted the OPA's third alternative suggestion to hear the matter on the basis of a complaint filed by the OPA itself.

After a hearing, at which the OPA introduced evidence on earnings and taxes, and after submission of briefs, the Commission, on June 15, 1943, dismissed the complaint, pointing out that the Company's fuel clause was an established part of its rate schedule, approved by the Commission; that under Wisconsin law it would be illegal for the Company to desist from the application of its fuel clause except upon due investigation, hearing and order of the Commission; that the increase in the particular charge complained of arose from an increase in the price of competitive oil ordered or permitted by the OPA itself; that the increase in revenue which would result from the change in billing would have an inconsequential effect upon the rate of return; and that its inflationary effect, if any, had not been shown by the OPA. The Commission indicated that in a separate action upon its own motion it would investigate the propriety of continuing, in wartime, the application of fuel clauses based on the price of competitive fuels. A hearing in that matter has now been held but a decision has not, as yet, been rendered.

The Office of Price Administration filed a petition for a rehearing on its petition in the Milwaukee matter, which was denied by the Commission on the ground that the points advanced had been considered and that the petition did not disclose that any new evidence would be submitted. No court appeal has been taken in this matter and the period for review by the courts has now expired, so that opportunity for judicial review has been lost.

Potomac Electric Power Company

At the March, 1943, annual hearing of the Public Utilities Commission of the District of Columbia regarding electric rates under the "Washington Plan," the Potomac Electric Power Company advised that it was requesting no increase in rates. The Commission heard arguments by the Office of Price Administration in favor of abrogating the Sliding Scale Plan and by various federal agencies favoring a rate reduction, and the Commission indicated it probably would order a reduction of some $315,000 for the year. This reduction would be made, the Commission said, in accordance with the sliding scale provisions of the Plan. The Commission further indicated that it would follow this reduction with an investigation of the merits of the Plan which might be somewhat modified but not entirely abandoned.

In April, the Commission ordered a reduction of approximately $310,000 for the last nine months of 1943. In a 113 page opinion, Commissioner Hankin dissented and favored scrapping the Washington Plan. A month later four Federal agencies filed a petition with the Commission for a rehearing, claiming that the reduction should be $2,000,000 instead of $310,000. The Company also petitioned for a rehearing, claiming that the reduction was excessive. Both petitions were denied. The matter was, thereupon, appealed by the Company to the U. S. District Court for the District of Columbia, the Company contending that the reduction was excessive, and the OPA intervening in the appeal with a plea that the reduction was inadequate and the rates inflationary.

The Treasury Department, as representative of the Federal Government, the utility's largest customer, is also complaining against inadequacy of the reduction. Hearings were held before the U. S. District Court during the latter part of October, 1943. Its decision may be expected to determine (1) the rights of the OPA in a proceeding in which only a rate reduction is involved, (2) the treatment to which the governmeit is entitled as a customer, and (3) whether the Commission properly limited the proceeding to the basis and scope of the Washington Plan.

Washington, Marlboro & Annapolis Motor Lines, Inc.

On September 23, 1942, Washington, Marlboro & Annapolis Motor Lines, Inc., filed a schedule of increased rates with the Interstate Commerce Commission. Under the existing law, if no modification, change or suspension is ordered within 30 days, the rates are allowed to become effective. No order was issued and, accordingly, on October 25, 1943, the Company proceeded to make rates effective. In the interim, the Act of October 2, 1942, amending the Emergency Price Control Act, and an Executive order were issued, requiring the filing, with the Office of Price Administration, of notice of intent to increase rates. No such notice was filed and, on November 3, the OPA filed a complaint with the district court, asking an injunction against the increased rates, pending the Company's compliance with the requirements of the Act of October 2, 1942.

The district court dismissed the complaint on the ground that the action required of the Company had been completed before the law became effective. The OPA appealed to the United States Court of Appeals for the District of Columbia. On December 4, 1942, that court held that the requirements of the Act of October 2, 1942, superseded the Interstate Commerce Act in any respect necessary to achieve its purpose of stabilization. The law required, after October 2, 1942, the giving of 30 days' notice before making any general increase in rate levels of September 15, 1942, and also consent to OPA intervention; and the Court held that the fact that application had been made prior to October 2, 1942, and had not been protested during the statutory period created no exception to the law. In consequence, the Court ruled that the district court should grant the injunction.

Chicago Surface Lines

Early in 1942, the Illinois Commerce Commission granted a provisional increase in the fares of the Chicago Surface Lines, from 7¢ to 8¢. In May, 1943, the Commission made this rate permanent. The Office of Price Administration had opposed the permanent increase contending that it would be inflationary. In making the provisional increase permanent, the Commission ruled that the increase was necessary to prevent the Company from operating at a loss. The City of Chicago and the OPA requested a rehearing in the matter and, in June, 1943, the Commission denied the request.

Conestoga Transportation Company

The Conestoga Transportation Company petitioned the Pennsylvania Public Service Commission for permission to raise freight rates 22%. Notice and consent to intervention were given to the Office of Price Administration, but the Company denied the OPA had the right to intervene, on the ground that general increases were not involved. However, the Commission held that a general increase in rates was effected by the filing of the new tariff and denied the application in July, 1943, when it learned that the Company was making an overall return of 7.43% on its transit and bus operations. The Commission endorsed the Company's contention that each department should be self-supporting but qualified its endorsement to apply to normal times, ruling that, in view of the adequacy of earnings and the Federal Government's stabilization program, the disposition of the case should be governed by the general welfare and public interest which would be detrimentally affected by an increase. The right of the OPA to intervene in this case was acknowledged by the Commission.

Western Kentucky Gas Company

On September 25, 1942, the Western Kentucky Gas Company filed with the Kentucky Public Service Commission an application for a $16,800 annual rate increase in 26 small communities and notice of the petition was duly sent to the Office of Price

Administration. The OPA did not intervene except by correspondence. The Company claimed that the increase was necessary as its presently earned rate of return was 1.3% and that the proposed rates would yield a return of 7.6%. On July 16, 1943, the Commission ruled against the increase, basing its decision on the President's "hold the line" order and not on the merits of the case under normal conditions.

Southwestern States Telephone Company

The Southwestern States Telephone Company applied to the Corporation Commission of Oklahoma for permission to increase the Company's telephone exchange rates at Binger, Oklahoma. This matter was heard in May, 1943, and denied June 2, 1943. The Office of Price Administration requested the Commission to take the application under advisement pending the preparation and filing of a brief by the OPA in opposition to the increase. The Commission concluded, however, that such delay in rendering a decision was not necessary in view of the fact that "the over-all operations of this Company show a substantial return on its investment" (7 per cent in 1941 on its book value, after paying depreciation expense and all taxes), that if the Company earns less at Binger it earns more than it should be allowed at other places, and that the regulatory Commissions were requested by the President to discourage utility rate increases during the war emergency, in an effort to prevent inflation.

Philadelphia Gas Works

An interesting example of the effect, in certain instances, of price regulation of commodities and services used by public utilities, recently occurred at Philadelphia. It was reported, early in April, 1943, that increased gas rates in contemplation there would not be effective until May 15, and that such delay in effective date was for the purpose of ascertaining the attitude of the Office of Price Administration concerning provision for relief through a Federal subsidy or an adjustment in the price of fuel oil for making gas. If such relief should not be provided, the Philadelphia gas commission intended to adopt an emergency rate increase of 2¢ per 1000 cubic feet, which previously had been requested by the Philadelphia Gas Works and approved by the city commission. A week or so later, the Company withdrew its application and the Commission rescinded its order of approval, following an order of the OPA, "freezing" the price of coke oven gas and resulting in a reduction in the operating costs of the Philadelphia Gas Works Company.

Pacific Gas and Electric Company, et al.

A case involving Pacific Gas and Electric Company and three other utility companies is rather unusual in that they requested the approval of the Railroad Commission of California to defer temporarily an effective increase in authorized charges for electricity, gas and steam under their fuel clauses, which would have become applicable, May 1, 1943, as a result of an increase in the posted price of fuel oil.

It is important to understand the situation, particularly as it has been pointed out by the Office of Price Administration as an example of voluntary waiver of automatic price increases which would have resulted in an inflationary effect. The fact is that the fuel clauses in question are based on variations in the price of fuel oil whereas the principal fuel used by the utilities is natural gas. The price of natural gas had been pegged by the OPA while the price of oil, which constituted a gauge for variations in charges under the fuel clauses, had been permitted to advance to the extent of 25¢ per barrel. Furthermore, only a relatively small proportion of the electric energy of Pacific Gas and Electric Company is generated from fuel and, in the case of the other companies, the electric energy is either purchased or produced by hydroelectric power or from natural gas fuel, the price of which had been pegged. Thus, except for adoption of the waiver of the operation of the automatic fuel clauses, the companies stood to gain a large sum in excess of the actual advance in the cost of fuel used. The plan involved absorption by the utilities of such actual increase as might occur in the fuel cost.

In its order of April 27, 1943, the California Commission approved the proposed temporary deferment of increases under the fuel clauses, but pointed out that the advance in the price of fuel oil and the "freezing" of the natural gas rates were likely to cause grave problems in price differentials, particularly between large industrial consumers of gas and oil. The Commission, therefore, retained jurisdiction for possible future modifications of its order.

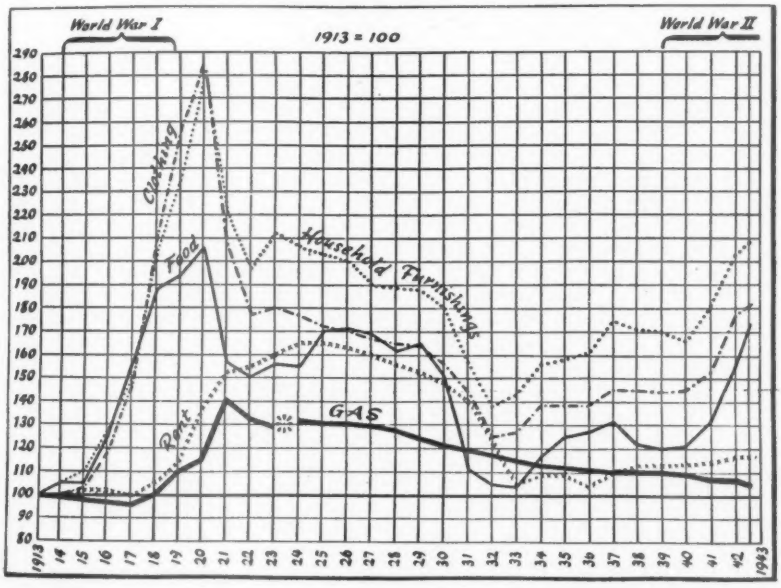
San Diego Gas & Electric Company

In April, 1943, San Diego Gas & Electric Company filed notice with the Office of Price Administration of an impending increase in billing under certain of its rate schedules as a result of the advance in the price of fuel and the operation of the Company's automatic fuel clause which previously has been authorized by the California Railroad Commission and has been effective for many years. Although such fuel clauses have been automatic in California, the Commission has required that notices of increases resulting from them be given to the OPA with an opportunity for objection to be raised. In the San Diego case, the Company filed notice, the OPA objected, the Commission suspended the impending changes, and the OPA intervened.

The Company introduced evidence to show that its fuel clause is based on cost of fuel actually used and that the amount to be collected would be less than the actual increase in cost. In this respect the situation differs materially from that in the case of Pacific Gas and Electric Company, et al.

The OPA introduced no evidence in the San Diego case but argued that the Com-

Thirty-Five Year Trend of Regulated Gas Service Costs, Compared With Unregulated Living Costs



© Public Utility Reports, Inc. Source: U. S. Bureau of Labor Statistics. Indices for average living costs in typical American cities adjusted to 1913 basis. Note: Since 1923, U. S. Labor indices for gas (manufactured and natural) are based upon heating content (30.6 "therms" monthly usage—adjusted to 1913 index for this chart). Indices before 1923 were based upon cubic foot usage (manufactured gas only)

pany should forego the increase in billing because it would retain, after taxes, only a small fraction of the advance in revenues collected. The OPA also opposed the allowance of taxes beyond the normal amount of the pre-war period.

In a decision rendered October 21, 1943, the Commission vacated the suspension of the increased billing under the Company's fuel clause and ordered it to become effective October 15, 1943. In its opinion the Commission pointed out the limited application of the fuel clause and said, "An investigation such as this is not viewed as a rate proceeding, and, accordingly, it seems unnecessary that the Commission at this time review and pass upon the many factors that must necessarily be considered in determining the reasonableness of utility earnings and the rates being charged to its customers." . . . "It should be understood that this rate adjustment is not made in order to increase the net earnings or the rate of return of the utility. It is made to maintain a proper and fair relation between the different classes of consumers."

In the following footnote to its opinion, the Commission explained the important distinction between the situations existing in the actions involving the fuel clauses of Pacific Gas and Electric Company and San Diego Gas & Electric Company:

> "Reference is made in the brief of the Office of Price Administration of the 'highly commendable recent action of the Pacific Gas and Electric Company, which with the proper approval of the Commission, suspended the application of its fuel clause under very similar conditions.' while the action of the company named may be looked upon as 'very commendable', yet the conditions are different. The Pacific Gas and Electric Company produces two-thirds to three-quarters of its electrical requirements from energy developed from water power plants, while the San Diego Company has no hydro-electric production. Likewise, the Pacific Gas and Electric Company has available larger quantities of gas, and accordingly, much less percentage of fuel oil is used in its steam electric plants than the San Diego Company. The differences are further shown by the fact that both utilities had about the same estimated increase in fuel oil costs, although Pacific Gas and Electric Company has electric sales and gross revenue which are in excess of ten times that of the San Diego Company."

Dedham and Hyde Park Gas and Electric Company (Mass.)

In a matter involving a proposed increase in the gas rates of Dedham and Hyde Park Gas and Electric Company, asked for in August, 1942, the Massachusetts Department of Public Utilities deferred decision at the request of the Office of Price Administration pending examination by the OPA of information furnished to it by the Company. After expressing objection to the operating results shown by the Company on the grounds that the Company's financial position compared with 1940 was improved and that the net earnings were understated by reason of an increase in the annual allowance for depreciation and the inclusion of all federal income tax instead of an amount equal to the pre-war level of 19%, the OPA concluded that the proposed increase in rates would result in an excessive rate of return. Nevertheless, by letter addressed to the Department of Public Utilities, March 25, 1943, the OPA announced that it did not propose to seek to intervene in a formal hearing, but that this should not be construed as a consent to or agreement with any of the contentions advanced by the Company in the proceeding before the Department.

Considering the OPA's assertions, the reason for its non-intervention is not evident, especially in view of its position in other cases. Subsequently, in May, 1943, the increase was disallowed by the Department of Public Utilities, which pointed out that the stockholders have withstood a long period without dividends; that increasing amounts have been carried to surplus during the past two years; that the earnings will probably continue to improve during the war; that the effect of hardship to the Company due to increase in cost of fuel is largely eliminated by fuel clauses in existing schedules; that the proposed changes would tend to increase the cost of living; and that while the Department is bound by established principles of utility regulation it desires to cooperate in the prosecution of the war by not allowing an increase in the cost of living unless undue hardship to the utility would result. However, the Department added that, "Should the net revenue of the Company show a tendency materially to decrease instead of to increase, doubtless the filing of new schedules of rates might be in order."

Public Service Company of Colorado

The Public Service Company of Colorado notified the Office of Price Administration informally, early in 1943, of its intention to make effective an increase in fuel charges under the Company's automatic fuel clause. The OPA, thereupon, filed objection with the Colorado Public Utilities Commission. Although the Commission notified the OPA that it could be heard at a public hearing, if it so desired, no further action was taken by the OPA and the change in fuel charges followed. The reason for the OPA's inaction in this case is not apparent, except possibly the existence of other cases then being tried.

The Bridgeport Gas Light Company (Conn.)

In April, 1943, The Bridgeport Gas Light Company filed notice with the Office of Price Administration that there would be an increase in the fuel charge the succeeding month, under an industrial gas rate applicable to eight large users. The OPA filed notice of intervention 30 days later and the case was heard in May. Subsequently, information requested by the OPA was furnished by the Company and, on July 6, the OPA requested leave to withdraw its petition without prejudice.

Oklahoma Gas and Electric Company

The Oklahoma Gas and Electric Company notified the Office of Price Administration July 8, 1943, of a filing of a proposed change in electric rates with the Corporation Commission of Oklahoma, involving principally a reduction in rates, but including certain minor increases resulting from the proposed elimination of certain old schedules no longer generally applicable and affecting less than 100 customers. After examining information furnished by the Company the OPA decided not to intervene.

Eastern Indiana Gas Company

In its order of August 10, 1943, the Public Service Commission of Indiana allowed Eastern Indiana Gas Company to increase its natural gas rate by about 20%, raising the rate of return from 1.93% to 5.5%, contingent upon the Company's obtaining an additional gas supply. The decision was written by one commissioner, with one concurring in the result only and the third not participating.

The OPA had opposed the increase on the ground that Federal taxes should be included as operating expenses on the basis of 1939 only, and that any war excess should be charged against return. That position on taxes was overruled by the Commission which said that the law does not permit the Commission to make such an elimination. Referring to "some Commission decisions dating back to World War No. 1 wherein only the normal Federal taxes were allowed as a charge against operating expense, while all taxes directly attributable to the war were not included as such," the Commission's opinion asserted that "Even so, it would appear that such action was illegal."

Commission and Court Reactions

The foregoing examples of utility matters in which the Office of Price Administration has been interested indicate, in some measure at least, its conception of its authority under the Emergency Price Control Act and reveal a broad objective not only to prevent inflationary increases in rates but also to influence regulatory action, even to the end that rates shall be reduced below their level of September 15, 1942. This was particularly observable in the Washington Gas Light Company case in which the OPA sought action to set aside the sliding scale rate agreement and to introduce evidence on the various elements of rate making, and in the Potomac Electric Power Company case in which the OPA joined with other Federal agencies to secure a rate reduction. It was

also apparent in the Detroit Edison Company case in which the OPA joined with the City of Detroit in an effort to secure a large reduction of rates, most of which would have come out of the Company's excess profits taxes.

It is noteworthy that in various cases, in relation both to decreases and increases in rates, the OPA has presented arguments, and to a limited extent, evidence, in relation to the utilities' earnings, and it has repeatedly contended that Federal taxes in excess of the pre-war level should not be charged to operating expenses but to the utilities' net return; all of this, notwithstanding the fact that the Emergency Price Control Act specifically excluded the rates of public utilities from its regulation and granted authority to the President or his agency merely to intervene in relation to the inflationary effect of any proposed rate increase, in a proceeding before the regulatory authority concerned, in which the utility asks for approval of the increase.

The public utilities in general appear to have observed the letter and the spirit of the Emergency Price Control Act. This is attested both by the limited number of applications for rate increases and by the notices given to OPA in case of increases in rates for which applications appeared warranted. In some cases, utilities have notified the OPA even when the circumstances appeared not to give the OPA right of intervention.

The regulatory Commissions also generally have cooperated with the OPA by receiving from it such evidence and arguments as it desired to submit, even in cases which evidently were not covered by the Emergency Price Control Act. In certain instances, the Commissions have permitted the OPA to initiate, or to cooperate with others in initiating, cases involving rate decreases, apparently to avoid any appearance of obstructing efforts of the President's agency in the discharge of its duties under the price control law. In a certain few instances, Commissions have gone so far as to concur broadly in the OPA's opposition to practically all increases in rates and have declined to give the merits of applications the consideration which normally would be accorded them.

The regulatory Commissions generally have recognized the proper distinction between the broad powers of regulation with which they have been charged and the limited authority granted by the Congress to the President's delegated agency to intervene in proceedings before them for the purpose of introducing evidence in relation to the possible inflationary effect of rate increases. They have, in various instances, received evidence or arguments presented by the OPA on matters which the Commissions thought were not within the field prescribed by the Emergency Price Control Act, and they probably will continue to do so as a matter of policy. But, one of the principal complaints against the position of the OPA concerning rate increases is that every such increase is said to be inflationary and, therefore, generally unwarranted but no evidence is introduced by it on the matter of the inflationary effect. In the Milwaukee Gas Light Company case, for example, the Wisconsin Commission pointed out that the effect of the fuel clause complained of by the OPA was actually the result of an increase in fuel price permitted by the OPA. Commenting generally on this situation in a paper presented in September at the 1943 War Conference of the National Association of Railroad and Utilities Commissioners (NARUC), Commissioner W. F. Whitney of the Public Service Commission of Wisconsin made the following cogent statement:

> "Just what 'inflation' is, and whether or not it is the *cause* rather than the *effect* of a general increase in price levels, is beyond the scope of this paper. It would seem, however, to be a proper subject for earnest consideration by OPA to determine generally what is and what is not 'inflation,' to the end that it might present probative evidence to state commissions upon the all-important question: Is the particular rate increase, in the particular proceeding before a state commission, inflationary?"

Mr. Whitney went on to say that in the Milwaukee case the Commission "inquired of OPA the real reason why it had permitted an increase in the price of No. 3 fuel oil as presumably non-inflationary while simultaneously it contended that the resultant very slight increase in utility gas rates was inflationary. No answer was forthcoming."

Discussing the inflationary nature of rate increases and automatic rate adjustment clauses, particularly the fuel clauses, Director Robert A. Nixon, of the Transportation and Public Utilities Division of the OPA, made the following statements in an address before the same conference of the NARUC:

> "In the exercise of authority delegated to us, we have been met with the query: 'What constituted an inflationary rate increase?' This question pre-supposes that in order to give effect to the national stabilization program, a regulatory agency must first determine whether or not the proposal is inflationary in character. I submit that the inflationary character of a specific rate increase is not the issue. All price increases are inflationary. This is the very foundation upon which the national policy of economic stabilization is constructed. The Emergency Price Control Act and Executive Orders issued thereunder do not distinguish between small increases and large ones, and insofar as price control applies to all other commodities and services, the mandate is to prevent *all* increases except in those cases where increases are shown to be necessary to aid in the successful prosecution of the war or to correct gross inequities."
>
> * * * *
>
> "I hear a murmur that all such matters (application of automatic rate adjustment clauses) are not the concern of the Director of the Office of Economic Stabilization. However, such clauses may call for adjustments 'to aid in the effective prosecution of the war, or to correct gross inequities,' by affecting other costs and prices; i.e., prices of things in which utility prices are cost factors. Therefore, *they are* the concern of the Director.
>
> "Price rises stemming from fuel clauses are as inflationary as other prices. Inflation is a word used to signify the unequal, unbalanced relationship between the supply of purchasing power and the supply of things that can be purchased. . . . . It comes down to this; inflation is a state of generally rising prices. Utility prices rise and thereby add their impetus to the general movement, purchasing power is transferred from the customers to the utility, but the customers do not necessarily take it lying down. They either draw on other funds, such as savings, or seek increased income to offset their increased outgo. Thus, the total effective purchasing power for an unchanged lot of purchasable commodities and services may be increased. This is the essence of inflation.
>
> "Whether the fuel or other adjustment clauses were in the utility schedules before the war broke out, whether the customers approve of the application of the clauses, whether the increases effected are relatively small in cents per kilowatt hour, or per 100 cubic feet of gas per monthly

bill, whether the fuel or other adjustment factors are fairly determined, and whether they would appear to be just and reasonable in peacetime, or even in wartime, as to all aspects, other than inflation—all these factors become irrelevant when the question is: Whether or not the effects of the adjustment clauses are inflationary. As stated earlier, they are, and demonstrably so."

The most significant Court decision, up to now, interpreting the Price Control Act in relation to the regulation of public utility rates, is the opinion of the U. S. Court of Appeals for the District of Columbia, in the Washington Gas Light Company case, mentioned earlier in this article. In that opinion, the Court indicated that the Commission had accorded the OPA every reasonable consideration for the introduction of evidence on the matter of inflation, for which the law provided, even permitting participation in the case before the passage of the Act of October 2, 1942; had given due consideration to the OPA's suggestions; and had been conservative in its conclusions by allowing to the Company probably less than the sliding scale agreement called for.

The Court further pointed out that the original Act accorded different treatments for prices of commodities and for rates of public utility service by specifically providing ". . . . that nothing in this Act shall be construed to authorize the regulation of . . . . rates charged by any common carrier or other public utility, ... ," to which the Court added that, "It is obvious that the utility rates were excluded from the subject matter over which the Price Administrator was given broad powers of control in the original Act," and "It is equally clear that the power of regulatory bodies to fix utility rates was left unchanged by the amendatory Act except that the designated agency of the President was given the right to intervene and to be heard in any rate proceeding before any increase in rate in force on September 15, 1942, could be made effective." The Court said that its conclusion, to the effect that the standards of price regulation imposed on the President were not imposed upon regulatory commissions, is supported by the legislative history of the amendatory Act of October 2, 1942.

In speaking of the general scope of the investigation urged by the OPA in the Washington Gas Light Company case, the Court of Appeals said:

"In its essence, the question raised in this aspect of the case is whether the Commission as a regulatory body, or the Price Administrator as intervenor, should control the scope of the investigation. We do not think that the mere right to intervene in a rate proceeding conferred upon the Price Administrator by the Act of October 2, 1942, includes the power to compel the regulatory body to undertake a complete rate investigation against its better judgment, much less an investigation upon lines contrary to the governing statute." 50 PUR (NS) 33, 50.

The outstanding commission and court decisions in cases involving the Office of Price Administration, and particularly the decision of the U. S. Court of Appeals for the District of Columbia in the Washington Gas Light Company case, have now quite definitely indicated the scope of the authority of the OPA, as intended by the Congress in relation to rates of public utilities. Such scope of authority covers intervention in the case of proceedings involving rate increases asked for by public utilities, for the purpose of introducing evidence on the inflationary effect of such increases, but investigation of other matters in any particular case appears to be subject to the judgment of the regulatory body. The scope of authority of OPA evidently does not include the right to initiate proceedings for, or to intervene in, cases involving rate reductions, although, of course, Commissions having the right to do so may initiate such proceedings on their own motion at the suggestion of the OPA.

Automatic rate adjustment clauses that were in effect prior to September 15, 1942, are regarded as established parts of rate schedules under the laws of certain states where previously they had become effective by regulatory authority and now require no further action to make them effective. However, even under this condition certain Commissions have required that notice be given to the OPA before changes in billing occur under such clauses. In other situations in which the application of rate provisions require periodic examination and action by the regulatory Commission, utilities have been required to serve notice of any increase in billing under them.

These observations regarding the status of the relation of the Office of Price Administration to the regulation of public utility rates are based on the Emergency Price Control Act and on decisions that have thus far been rendered. Although the questions involved have not as yet been considered by the Supreme Court of the United States, certain of them, relating to major issues, have been presented and will be argued and decided in the Washington Gas Light Company case in which the Court has already granted a petition of the Office of Price Administration for a review.

NEW MEMBERS OF THE A.G.A.

GAS COMPANIES

	Delegates
Attleboro Gas Light Co. Corp., Attleboro, Mass.	Wm. J. Luther
Clearwater Municipal Gas Department, Clearwater, Florida	Grant G. Greer
Kokomo Gas and Fuel Company, Kokomo, Indiana	Edw. M. Hahn
Monarch Gas Company, St. Elmo, Illinois	M. B. Garman
Princeton Gas Service Company, Princeton, Illinois	C. R. Vance
Texas Gas and Power Corporation, Pampa, Texas	J. W. Garman

MANUFACTURER COMPANY

Norton Company, Worcester, Mass. — Kenric H. Bird

INDIVIDUAL MEMBERS

Alex. E. Bauhan	Public Service Electric & Gas Company, Newark, N. J.
Jerome E. Bonnabeau	The Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
David L. Brown	Consumers Power Company, Pontiac, Mich.
Charles F. Dexheimer	Fuelite Natural Gas Corp., Lexington, Mass.
Mrs. Lillian P. Dunbar	Cambridge Gas Light Company, Cambridge, Mass.
Arthur M. Dunstan	W.P.B., Office of Civilian Requirements, Washington, D. C.
William L. Glowacki	Mellon Institute of Industrial Research, Pittsburgh, Pa.
S. E. Linderman	Cast Iron Pressure Pipe Institute, Washington, D. C.
Herbert C. Porter	Kansas City Gas Company, Kansas City, Mo.
Orin W. Rees	Illinois State Geological Survey, Urbana, Ill.
John W. Ross	Citizens Gas & Coke Utility, Indianapolis, Ind.

Heating Revolution . . . *Development and Implication of Industrial Gas Techniques*

Frederic O. Hess

By FREDERIC O. HESS

President, The Selas Company, Philadelphia, Pa.

AT first glance this title is somewhat frightening. There have been so many big social, political and technological revolutions in our lifetime that it seems presumptive to use the same word as applicable to our own interest, "Industrial Heating"—or more specifically "Industrial Gas Heating."

Restricting this observation to technical matters only we have experienced the revolution of the automobile, the revolutionary effects of ordinary electricity, and of its off-shoot "the radio." We are beginning to witness the revolution of the airplane; and we are being loudly—*very loudly*—acquainted with the forthcoming electronic revolution of all revolutions.

To justify and clarify this title let us take a look in dear old Webster. He defines revolution as "radical changes"—and upon further investigation we learn that "radical changes" are brought about by either external pressure or by internal developments. On that basis the title assumes a more appropriate meaning, because if we of the gas industry look about we certainly can see—we must see and recognize—some very radical changes.

Let us review briefly and analyze some of these radical changes. Let us particularly project their effects—be they actual or only indicated. When doing so we can, I believe, develop facts, which permit considerable optimism, provided we are prepared to take advantage of our opportunities—and if we are willing to adjust ourselves to the revolutionary obligations afforded us and imposed upon us.

One of the recent, important developments of radical effects has been the gas-fired radiant tube as applied to furnace heating. This method of gas heat application has not only been defensive against the electric furnaces and electric heating elements, but let us remember that it eliminated certain harmful chemical and physical effects of products of combustion upon the materials treated.

We have here a deliberate heat application—influenced in manner and scope by chemical and physical reactions, which were either eliminated or made possible. Unfortunately, however, radiant tubes have been limited to temperatures below 2000° F.—and this fact excluded a good many industrial heat applications, such as ceramic kilns, copper brazing and forging. Fortunately gas fuel as such is not limited, and the gas industry has some developments and substitute processes available which effectively compete and broaden the use of gas. Some radical departures in technique are necessary, and the accompanying illustrations might effectively illustrate some of the departures from conventional practice which have been possible and which have been necessary to keep pace with the rapidly changing production techniques. Obviously these pictures

Address before Industrial and Commercial Gas Section, American Gas Association Annual Meeting in St. Louis, Mo., October 26-28, 1943.

Figure 1

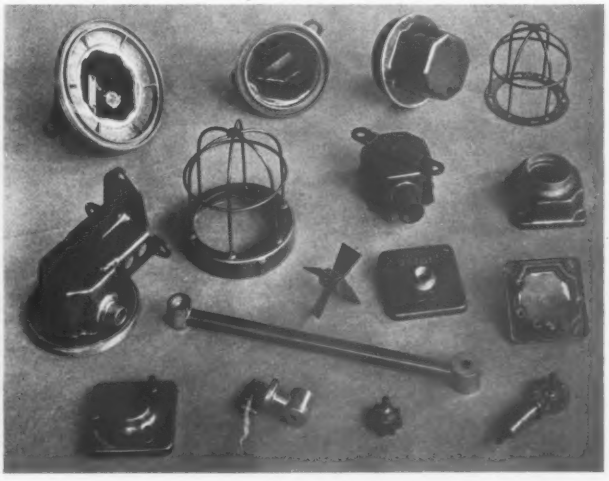


Figure 2

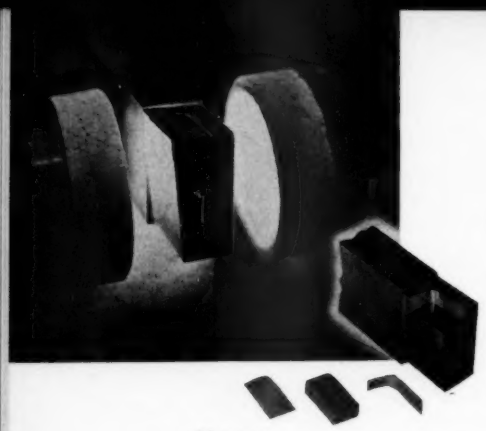


Figure 3

Figure 4

are selected and intended to illustrate process changes and not apparatus design and construction:

Figure 1 presents an internal view of a porcelain kiln for glaze firing, after reconstruction or conversion from oil firing. Formerly this kiln utilized a muffle with all its handicaps of slow heat transfer, difficulty of temperature control, external combustion chambers and maintenance. The clean-cut internal construction is obvious, and in more than 2 years of use, operation proved considerably more efficient than the previous firing method. Radiant firing plus accurate control of products of combustion appear responsible for successful glaze firing—an operation which heretofore seemed restricted to muffle kilns or electric kilns because—it was explained—of harmful chemical reaction of the products of combustion.

Copper Brazing

The high temperature required and the accelerated oxidation at those temperatures made the joining of metals by copper brazing an almost exclusive electric process. However the further development of low temperature brazing materials, improved technique and part design—an increased heat transfer by special gas burner designs—expand a manufacturing and assembly process so far claimed by competitive fuels—electricity and oxy-acetylene. The process of brazing might seem old, but let us not under-estimate the important advances of this technique. Promoted by war production, this production heat process will—and is—influencing post-war planning and post-war products.

Figure 2 illustrates a variety of parts assembled by brazing—the average time being less than 1 minute, and gas as fuel having proven ideal for continuous line production on a fully or semi-automatic basis. Many of these parts used to be castings requiring machining or were made in an entirely different manner on a considerably costlier basis.

Figure 3 is another illustration of a brazing operation. It's *only* a tool bit but it has caused a production revolution and is indispensable for today's production demands. Tungsten Carbide changed the machine tool industry and is used in practically every machine shop—but industrial gas has hardly been applied in this every-day operation of brazing the bit to the holder—in fact the manufacturers of the tools have recommended (in the past) either induction heating or oxygen and acetylene. Yet industrial gas has many advantages—the heat can be localized in contrast to induction heating, and less hazard exists of damaging the tool by overheating.

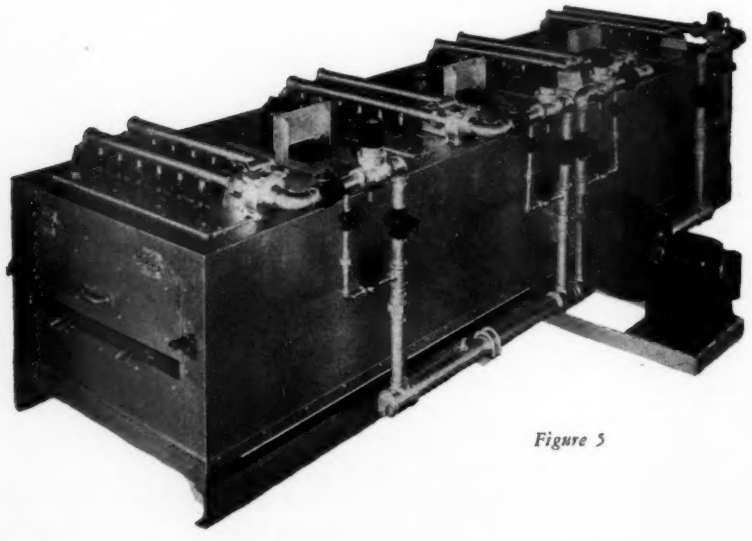


Figure 5

Old Art—New Technique

Another example of a revolutionary change in processing of materials can be illustrated by Figure 4 showing a printing press. Letter press printing is an old art but had reached very serious limitations until physical chemistry changed the picture. A natural process of oxidation has been supplanted by vaporization and polymerization—both accelerated by heat but controlled heat of an intensity so far not duplicated with any other fuel. One million two hundred and fifty thousand B.t.u. per hour are necessary to perform what might now be called the *chemical process of printing*—at a speed of 1,000 ft. per minute. This is a striking illustration of revolutionary changes in industrial heat applications requiring highly special equipment at fairly high cost, and an intimate knowledge of the printing technique and the process requirements.

A similar change—brought about by deliberate physical chemistry—hit the paint industry. New industrial

finish fostered short-curing cycles, and with it electric radiant lamps. This radical departure from old practices calls for a radical revision of gas ovens and drying methods or practices. In order to take advantage of these changes in the paint industry we must fully utilize all the fuel advantages of gas, and we must study characteristics of the process in order to coordinate it with the fuel to the full advantage.

Figure 5 shows an experimental oven for the drying of a special product in less than 2 minutes—against a previous cycle of 20 minutes. In this case the processing material had not been changed, but the investigation of the drying process brought about the shortening in cycle, resulting in an installation many times the size of this experimental unit.

Laboratory Controlled Processes

Metal finishing, wood finishing, plastic coatings, drying—are all undergoing radical revisions—they are changing from shop techniques to laboratory controlled processes. The curing or heating techniques required and demanded can no longer be crude, and that is one reason why electric lamps and high frequency short wave induction current have appeal. The changes in the paint and drying industry must make us realize that the time of the "hot box" seems over, and if we are not keeping pace with the changes in materials and processing, the industrial finishing and related industries will proceed and speed up without us.

Another revolutionary process change is now being promoted for tin conservation, but has very much broader implications. While formerly tin plate was made in the hot-dip process—which consumed large quantities of gas for firing the tin pots—the new electrolytic application of tin on strip and the subsequent fusion of the tin to the steel by heat—has been claimed by induction, as well as resistance heating—and this method of heat application has found extensive support by the various Government agencies.

Here is the beginning of a radical departure from an old established process, involving—in peace time—more steel tonnage than any other American industry except the automotive industry and consuming millions of cu.ft. of gas every day. The new process requires heat—just about as much heat as the dip process—but applied differently.

Diagrammatically illustrated in Figure 6 is an installation utilizing radiant gas heat for tin fusion—and, as in many other cases, gas offers a wider control range, a greater flexibility, and it can be applied at a considerably lower investment as well as operating cost. It might be interesting to note that the advocates of induction heating claimed that the reflective qualities of electrolytic tin plate would prevent the successful application of radiant heat while, as a matter of fact, electrolytic tin presents a rough, porous surface, and therefore an ideal absorbent for radiant or convection heat.

Revolution in Metal Heat Treating

Even though the foregoing pictures illustrate some radical changes, the real revolution in industrial heating seems to take place in the metals heat treating field. You are undoubtedly familiar with induction heating and the nationwide, aggressive application and sales campaign by the electrical industry; somewhat less familiar perhaps with the extensive promotion of induction heating by the Government, and possibly still less familiar with the position of the gas industry and the broad implications of this metallurgical—and again physical—chemical revolution.

Extraordinarily short and rapid heating times by induction heating upset certain prevailing ideas about heating rates of metals. However it was concluded this was due to electronic heating, which permitted different heat transfer than obtainable with other methods. Gas heat represents one of these other methods but fortunately it has not been superseded nor can it be counted out. On the contrary gas seems to be in an excellent competitive position and destined to take part—and even pioneer—in this heat-treating revolution, if we are willing to depart from conventional practices and consider text-book and old established operating principles (as 1″ per hour heating rate, etc.) obsolete. Let us look at some examples for such defying and optimistic statements:

Figure 7 is a view through a continuous automatic annealing machine, annealing ¼″ wall steel tubing lo-

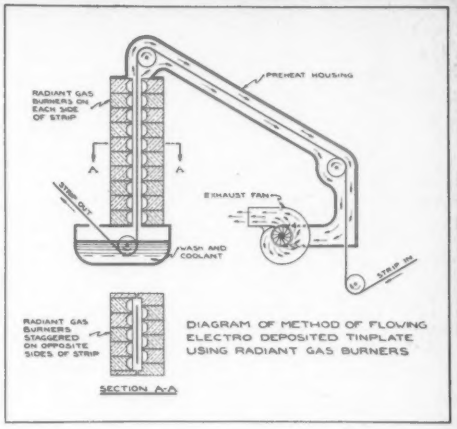

PREHEAT HOUSING
RADIANT GAS BURNERS ON EACH SIDE OF STRIP
A
A
EXHAUST FAN
STRIP OUT
WASH AND COOLANT
STRIP IN
RADIANT GAS BURNERS STAGGERED ON OPPOSITE SIDES OF STRIP
SECTION A-A
DIAGRAM OF METHOD OF FLOWING ELECTRO DEPOSITED TINPLATE USING RADIANT GAS BURNERS

Figure 6

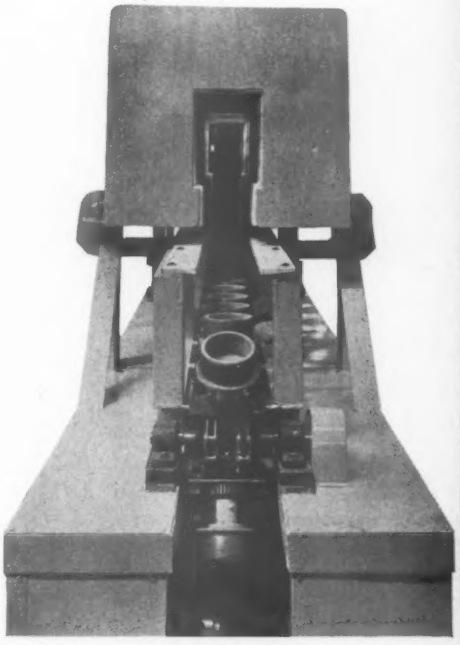


Figure 7

Figure 8

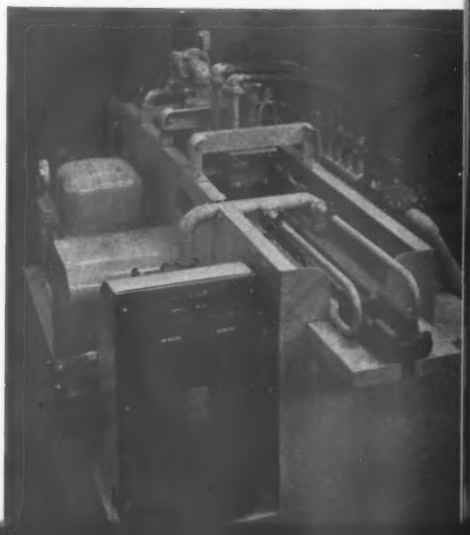
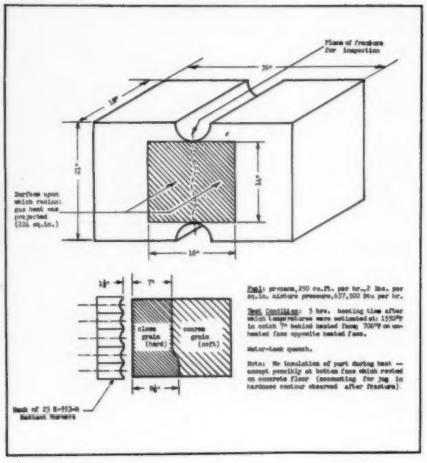


Figure 9

Figure 10



calized 4" from the top down—in 2 minutes, and regularly producing a full anneal.

Figure 8 might justifiably be described a machine tool for heat treating. The unit was designed to automatically flame harden the top ¼" of a solid steel bar 1" square—which forms the tread of a tank grouser. The equipment is push-button operated, and has a production rate of 1 grouser every 55 seconds, which calls for a heat transfer rate sufficiently high to melt the solid steel bar if it is exposed to the burner equipment for a total time of 2 minutes.

Competitive electric induction equipment could produce the same surface hardened bar in about the same time—but the equipment would have involved approximately 4 to 6 times the cost of gas equipment. Comparable fuel costs are also in a ratio of 1-4 in favor of gas.

A production machine for heat treating such armor piercing shot would appear similar to the unit shown in Figure 9. This particular machine is being used for base drawing 37 M/M shot—hardened by the salt bath method—but almost identical equipment with the addition of a spray quench can be utilized for hardening 37 M/M shot—and a slightly larger unit for 75 M/M or even 105 M/M shot.

This means that a single-line conveyor unit having an overall length of approximately 30 ft. is capable of hardening about 300 75 M/M armor piercing shots per hour while for similar production approximately 22 single-coil or 6 quadruple-coil induction units would be required. Such comparisons seem to confirm the contention that gas is in a competitive position.

A somewhat more severe heat application is shown in Figure 10 which illustrates the method of surface hardening a center portion of a section of 18" thick armor plate to a depth of 7"—10 times faster than the present practice. In addition to this reduced heating time, definite metallurgical advantages are obtained which can, however, not be subjected to discussion at this time.

Heat-Treating Examples

We have seen here but a few examples of radical industrial process changes. There are numerous other examples of rapid heat transfer or heat treatments:

1/16" thick wall stainless steel tubing is being fully annealed in 5 seconds.

The welded section of ⅛" wall steel tubing is being annealed in 10 seconds—or at the production rate of 40 ft. per minute—in such a manner that it is difficult to detect a metallurgical difference even on microphotographs between the original metal and the weld.

There are many other applications—and the localized heat treatments as well as the increased rates of heat transfer show equally striking differences in the non-ferrous industry. Traditions are being broken—but that's what revolutions usually do. The implications of these changes are of course immense. The heating method is exceedingly flexible and so is the equipment; practically no heating-up time is required—comparable to induction heating—but in contrast to furnaces.

The ability of performing localized heat treatment reduces the hazard of warpage and permits retaining original metallurgical structures wherever desirable.

Heating times are reduced with beneficial effects upon work in process, and equally beneficial effects upon the work piece by reducing the scale and decarburization. The extent of both scale and decarburization is not only a function of atmosphere, but very much a function of time.

Differences, and in many cases desirable differences, in metallurgical results are being obtained. Grain growth is being influenced and can be somewhat better controlled because of the shorter heating time.

It is obvious that these different heating cycles—permitting different methods of handling materials—the flexibility of operation and the relatively small size of high production units—will revise manufacturing methods and will revise production and products.

Industry Changes Needed

So much for the technical results and implications of the revolutionary changes in heating practices and techniques. I hope you agree that gas fuel is in an excellent position to take part in this radical transition in heating methods—but to be fully successful certain radical changes should be self-imposed within the gas industry.

We have seen that practically all processes in industry which effect industrial heating are becoming more and more technical—and that the changes are largely brought about by advances in applied physical chemistry. We also know that gas is used not only as a fuel but as a chemical agent. Consequently special studies are required, and a thorough, intimate knowledge of the process is needed. The product as well as the characteristics of the fuel and its effects have to be thoroughly investigated. The industrial gas period revolving around

a piece of pipe and a pile of brick seems to be definitely doomed.

Maybe we can make the comparison that the gas industry will have to undergo the transition period passed through by the radio industry when changing from the crystal sets to the modern radio. Certainly there will always be field construction and self-help—but some of the elements required for these new heating techniques will be just as special and unsuited for construction by the average shop or gas man as the modern radio tube is unsuited for construction by the average "ham"—and he is a very valuable part of the radio industry.

We have not heard in our travels of any electric current salesmen building or designing for the customer an electric induction unit. Nor is it general practice that industrial plants construct their own electric furnaces or electric heating equipment—quite in contrast to past practices prevailing in the gas industry.

Obviously these remarks are an appeal for the support of the industrial gas equipment manufacturer—and it seems such support might be justifiable and beneficial to the entire industry. The gas industry is an old industry, and it does not seem plausible that out of the many good gas engineering organizations of the past—none has been able to grow to a size sufficiently large to afford a research expenditure of $100,000 and more on a promising project, such as a gas combustion turbine. But almost everyone agrees that a successful power generating unit of that type would find wide application and many uses.

Management Support Vital

Another essential change within the gas industry involves the attitude of the average gas company towards industrial gas and the industrial gas department. If industrial gas heating is to keep pace with the rapid advances of techniques and other heating methods, industrial departments will have to be larger and receive considerably more support from the management to do justice to customers—to processes—and to the Nation as a production center. Industrial gas men will have to be of high caliber—which automatically means that sufficiently high salaries have to be paid to attract the caliber man required for the task.

Maybe industrial gas at this moment does not represent as large a percentage of the gas load as cooking or home heating has provided—but did industrial gas not have to take over the baking load when the shift took place from baking at home to baking in industrial plants on a production basis? Such transitions can happen again.

Suppose the trend towards central plant heating is revived after the war—would not industrial gas be called upon to replace the home heating load in central heating plants?

Are we not witnessing now a revolutionary change in food and food preparation—and promptly industrial gas can and is being called upon to assist in the growing production of dehydrated foods.

To retain and improve the position of industrial gas will not only require extensive efforts, enthusiasm and careful planning, but also progressive and supporting policies.

Industrial gas has proven its importance, beyond any doubt, during the past few years, and has made many substantial contributions towards production—quality—and the future. Let us hope we are foresighted enough to take care of the future—so the future will take care of us.

Alcohol Injectors Reduce Hydrate Trouble

FREEZING hydrates, bugaboo of natural gas transmission, will have to overcome the effects of double and single barrel alcohol injectors in five Southern Louisiana gas fields this winter before they can cause trouble.

Double barrel injectors, designed and built by United Gas Pipe Line Company men, have been installed at Lake Long, Lirette and La Fourche gas fields and single barrel set-ups at De Large and Gibson fields in the Baton Rouge district.

The purpose of the injectors is to introduce alcohol particles into the natural gas lines at the origin of supply in an attempt to prevent freezing.

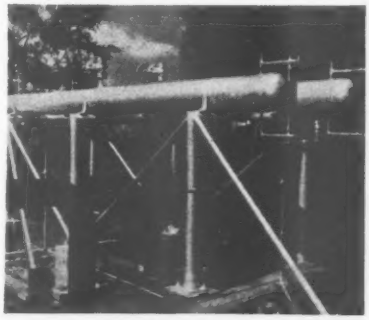
Once frozen, the line must be shut down, pressure taken off and the line blown. Then it must be purged and put back in service. Sometimes it may even be necessary to cut into the line. When the line is only partially frozen, alcohol can be injected with fair results.

The present injectors in the Baton Rouge district were designed in the General Office from previous operating experience, and were field fabricated in the warehouse yard at Houma, La.

The barrels consist of a piece of 12.75-inch outer diameter 49.56-pound pipe, 20 feet long with heavy heads welded on each end. Heavy nipples are welded in for the feed lines, equalizing line, gauge glasses and charging line. All fittings on the injector are 1000 pounds working pressure.

In operation the storage cylinders are partially filled with alcohol. The equalizing line is tied into the gas system upstream from the feed line. The differential in pressure between the point where the equalizing line is tied in and the point where the feed line enters the gas pipe line allows the gas to flow from the cylinders into the pipe line.

In addition to this, the units are always located on an elevation so as to allow the alcohol to flow by gravity into the feed line and thence to the pipe line.



A double-barrel alcohol injector at the Lake Long dehydration plant

Adjustable valves permit the plant operator to control the amount of alcohol flowing into the pipe line.

These units, of course, are in the nature of stand-by equipment for the dehydration plants. When the plants have to be shut down for any reason the alcohol injectors, always fully charged with alcohol, can be put into service at a moment's notice, mixing the alcohol into the gas and preventing the hydrates, which the dehydration plants would otherwise have removed, from freezing.

Capacity of the single barrel units is 115 gallons of alcohol, a day's supply. The double-barrel unit holds twice as much. Under average conditions the ratio of alcohol to gas is about one gallon to one million cubic feet. Sometimes it has been necessary to increase this to as high as three gallons to a million cubic feet as was the case on the DeLarge four-inch last winter.

—"United Gas Log"

Job Classification Manual Ready

THE Southwest Personnel Conference group of the American Gas Association has prepared and printed a manual of Natural Gas Distribution Job Classifications according to an announcement by Chairman M. V. Cousins, United Gas Pipe Line Company, Shreveport, La. The manual covers the functions and responsibilities, the minimum training and experience required for replacements under wartime emergency and the physical requirements for 118 job classifications found in all departments of natural gas distribution operations. It is for use in connection with Manning Tables, Replacement Schedules, Selective Service requirements and any other use to which a job classification manual can be put. It was compiled by a committee headed by Oakah L. Jones of the Oklahoma Natural Gas Company, Tulsa, Okla.

The books are bound and are available from American Gas Association Headquarters, 420 Lexington Avenue, New York 17, N. Y., at a charge of $1.00 per copy to cover the printing cost.

Open Sesame!

Mr Therm holds the key to King Coal's treasure cave At the gas works coal is made to yield not only gas and coke, but many chemical by-products as well These are the raw materials for the manufacture of an ever-growing list of everyday products Agricultural fertilisers, plastics, motor and aviation spirit, dyes, drugs, explosives, refrigerants, paints and varnishes. The list could be extended almost indefinitely.

The gas industry points the way to the wise and economical use of coal. At present gas (and other fuels) have to be saved so that the war factories may have all the fuel they need. After the war gas in plentiful supply will be at the consumer's service.

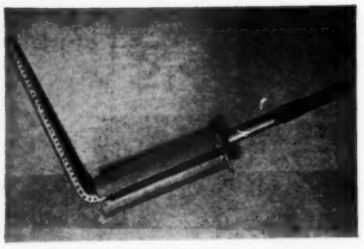
A post-war-slanted advertisement prepared by the British Commercial Gas Association

Synthetic Vitamins from Gas

SYNTHETIC vitamins, extracted by British chemists from coal in the process of gas making, are playing an important part in maintaining the nation's war-time health. These vitamins are B_1—carbohydrates or thiamine hydrochloride—and K. or menadione. The former gives protection against diseases due to gross deficiency, while the latter is a chemical substance which promotes coagulation of the blood.

Coal is burned under boilers to produce mechanical energy: carbohydrates are burned in the body to produce vital energy. It is significant that the first vitamin to be made synthetically from coal is one associated with carbohydrates. Vitamins are essential for the well-being and proper functioning of the body. Many of these are obtained from food and also in the action of the sun's rays on the skin. But where these are not obtainable owing to war-time stringency, they can be introduced synthetically into manufactured foods.—"The Gas World," October 9, 1943.

New Heater Pilot Light Developed



Wind-protected pilot

DEVELOPED by Frank Rothwell, industrial engineer, United Gas Pipe Line Company, the gadget pictured here is a pilot light with a wind shield.

It was developed for and is especially adaptable to use on flowing gas heaters which raise the temperature of gas in the lines to prevent freeze-ups and stoppages. Burners are thermostatically controlled. They shut off when required gas temperature is reached and come on again when temperature drops to the danger point.

Expanding gas produces a drop in temperature. Consequently, heating equipment is needed at points of regulation in fields, on tap lines and at city gate stations where excessively high pressures are cut to lower pressures.

A dependable pilot light often provides the difference between a frozen line and the continuation of uninterrupted service. —United Gas Log.

Lone Star to Sell Gas Plants in El Paso and Galveston

LONE STAR GAS COMPANY, Dallas, Texas, has announced sale of gas distribution plants in El Paso and Galveston to private companies after voters in El Paso had defeated a proposal for municipal ownership of the El Paso Electric Company and Galveston had voted down municipal ownership of the gas properties.

D. A. Hulcy, Lone Star president, has announced that contracts have been signed for the sale of El Paso properties to Southern Union Gas Company and Galveston properties to the Texas Public Service Company. The El Paso price is $2,700,000, including materials and supplies on hand, and accounts receivable. The contract was signed November 5 by Mr. Hulcy for Lone Star and for Southern Union by C. H. Zachry, executive vice-president. The Galveston purchase price is $2,383,000, including material and supplies on hand, and accounts receivable.

The contracts are the result of an agreement made by Lone Star Gas Company with the Securities and Exchange Commission for disposal of its distribution systems in El Paso and Galveston as part of the reorganization of the company effected last January.

Negotiations had been conducted for the purchase of the gas property by the City of El Paso, but these negotiations were deadlocked by failure to agree on price, and apparently were dropped after El Paso voters had defeated (by a vote of 2475 to 651) a proposition for municipal ownership of the El Paso Electric Company, owned by the Engineers Public Service Company, a Stone & Webster affiliate.

Southern Union Gas Company, with headquarters in Dallas, has operated gas distribution systems in Arkansas, New Mexico and Texas. In New Mexico, Southern Union serves the cities of Carlsbad, Artesia, Clovis and Santa Fe, and sells gas to other companies serving Albuquerque and Roswell. It also serves Pecos, Texas. Wofford Cain is president of the company.

Lone Star has owned the El Paso and Galveston properties since 1929 when they were operated as the Texas Cities Gas Company, the name being changed at the time of the reorganization last January. Gas is purchased from the El Paso Natural Gas Company whose pipe lines tap fields in New Mexico.

Involved in the Galveston contract is the natural gas distribution system on Galveston Island, served by gas purchased on the mainland from the Houston Pipeline Company. Texas Public Service Company would assume Lone Star's contract with the Houston Pipeline Company.

Texas Public Service Company operates the gas distribution system in Austin, Texas. William Lawlor Jr. is general manager and president of the company.

There had been negotiations to sell the Galveston properties to the city, but voters turned down the proposal last September 21.

Post-War Needs . . . *for the Continued Advancement of Gas as a Domestic Fuel*

By HUDSON W. REED

President, The Philadelphia Gas Works Company

THE post-war needs that have been suggested for consideration by the gas industry are too many and too varied to be reviewed in the time available today. One cannot help being intrigued by the scope of the plans suggested. They include both practical and visionary ideas; from curtailment of expense to the spending of uncalculable millions for research that should be made by other industries. Unless we carefully separate the visionary objectives from those required for successful post-war operation, the industry may find itself running around in circles looking in vain for revenue to pay for many intriguing but unnecessary projects.

It is not my intention to study the full scope of the gas industry's post-war activities, but to express to you my convictions on what I believe to be their most important phase. My remarks are addressed to all gas companies, but in particular to the straight gas companies—the companies who must sink or swim on the revenue received from the sale of gas alone.

No Gas Conversion Problem

I grant you that there will be many new problems that will confront the nation, but some industries *per se* will not face many conditions different from those experienced in the pre-war period. Our industry falls in this category. Let us then look into the future and see what is in store for us in the post-war era.

Unlike many manufacturing industries dislocated by war work, it will not be necessary for us to reconvert to peace-time products. We will be using the same manufacturing plants, pipe lines, services and meters; likewise, we will be using the same accounting procedure and office practice.

There is no present indication that there will be any considerable change in our distribution and production operations. For many years, we have given liberally in time and energy to numerous distribution and production conferences. But in the past decade few new ideas on production or distribution operations have been developed that were of material benefit to the industry as a whole. Problems arising in these two operating activities are generally local ones and are solved by local technicians. Developments of national scope concerning distribution and production during the period mentioned have, therefore, not contributed to any increase in the sale of gas. This statement goes for accounting and office systems; more costly, more elaborate, but not productive of sales.

The most serious problem facing the gas industry today is not production; not distribution; not accounting—but sales—sales of trouble-free, efficient gas appliances that are equal or superior to competitive equipment. We must continue to sell gas, not only to the same degree as in pre-war days, but in greater quantities to meet the increased costs which we hope may recede, but about which we have serious doubts.

The big job facing us will be to sell enough gas to fully use the facilities now on hand. We should, therefore, devote our time and energy to solve this problem, rather than to plan for the troubles we know not of. It is time to stop soaring in the clouds and come down to earth and start working.

Hudson W. Reed

Post-War Certainties

There are three post-war conditions we can be sure of:

(a) Increased taxes.
(b) Higher labor and material costs.
(c) Pre-war competition greatly intensified.

The first two conditions mentioned I do not propose to discuss—we may or may not be able to do anything about them. The third condition, however, we must control, because if we cannot win against post-war competition, there will be little sense in worrying about our other troubles.

I refer particularly to the threatened loss of our domestic gas load, the cornerstone of the industry, without which our revenue would slowly but surely dry up. It is important that we do not lose sight of the fact that our first and foremost responsibility is the retention of the domestic load; and the maintenance of gas as the dominant, accepted and modern fuel for the home. This supersedes, in my opinion, any other program for the post-war years.

Herein lies our basic problem, the retention of our domestic business,

Address before American Gas Association Annual Meeting in St. Louis, Mo., October 26-28, 1943.

because the revenue from these sales is our bread and butter. It cannot be replaced by other classes of loads, and if it slips away, as did gas lighting, we can put out the "Not At Home" sign and go fishing.

We should realize that we have before us a very important and familiar problem that must be correctly solved by each of us here if we are to successfully bring our own sections of this industry through the post-war period.

Do not get the idea that you cannot lose the domestic load—you are losing it. Do not be misled by the present increase in domestic sales. This increase is primarily due to the severe winter, the shortage of oil and coal, and the effect of wartime restrictions, such as gasoline rationing, on living habits. Most manufactured gas companies have lost a considerable amount of the potential cooking load to competitive fuels through the loss of the range load itself, and by the extensive use of table appliances. Water heating losses have followed to a lesser degree the loss of ranges, but in addition to the loss of water heaters there is a constant loss of water heating load to the summer-winter house heater hook-up.

Emphasis on Domestic Sales

Considering the constant and ever increasing losses in the domestic load, it is time for us to take stock of the situation and decide not only what is to be done, but also to do it now. Later may be too late, because the continuation of the present strong position of the gas industry depends almost entirely upon the added sales of domestic gas, not the sales of gas to large commercial and industrial customers. Such sales give small return, and few of us would increase our production and distribution facilities to secure them—not alone because of the low return, but to the lack of stability of such load.

To date, many of us have placed too much emphasis on securing large individual customers. Let us not be blinded by huge sales to such customers and give only lip service to the retention of the most profitable load. Without minimizing the worth of the industrial load, let me state that it will be of little value without the domestic business.

Each of you has read one or more of the many articles in the current magazines on the post-war home. How many of you have heard the word "gas" mentioned in any of these glowing accounts of how housework will be reduced to nothing flat, and how many of you have seen a gas appliance featured?

Recently a well-known mail order house issued an attractively printed and illustrated questionnaire, seeking public reaction on household appliances, but no mention was made of gas . . . . attractive drawings of competitive fuel ranges were shown, yet this same mail order house has been an important outlet for gas ranges in the past.

"Good Housekeeping" recently made up a film on canning. Was the range shown a gas range? Unfortunately, no. It only takes a continuation of similar propaganda to mould people's minds. At one time, we had this type of propaganda well under control, but the war seems to have put a stop to our efforts, at the same time stimulating our competitors.

Post-War Competition Started

The total absence of the mention of gas appliances in these articles should warn you that our post-war competition has already started—by propaganda at least—and it behooves the gas industry to start quickly to counteract this movement, or it will experience kitchen trouble such as it never dreamed of before.

What do we need to compete with this competitive advertising or propaganda?

The national advertising program of the gas industry has been advantageous to the industry in a number of ways. It has represented us in an effective way before our customers. To a more limited extent, it has given us entree to magazine editorial departments, and to other national advertisers, and it has encouraged gas appliance manufacturers to undertake their own national advertising programs.

It is important, however, that in addition to the showing of attention-arresting copy, these other corollary advantages be more fully developed; that we make certain that feature articles and other editorial copy use gas appliance illustrations, and that other advertisers use gas equipment when domestic appliances are shown. Gas appliance manufacturers should be further encouraged to undertake national advertising, and should be supported by the industry when doing so.

When I speak of competition I do not refer only to that which normally exists between two utilities operating in the same community. Were this the only problem it could easily be solved as evidenced by the smooth operation of many combination companies. In addition to our local competition we must face the attack of one of the world's largest manufacturing industries, who for thirty years have been knocking at the door for the domestic appliance business.

These manufacturers of electric appliances are busy with war work, but it is a safe bet that their laboratories are working to develop better and cheaper appliances for post-war sales. Anyone who has given serious thought to the future of the gas business must know that the post-war period will give these manufacturers an opportunity never experienced before. Do not pass lightly over this menace to your business. If you do, you will find yourself bucking traffic on a one-way street.

Premise for Gas Progress

Now what does the gas industry need to offset the constant encroachment of competitive domestic appliances? What plans for new or improved appliances should be developed by our laboratories? What steps should be taken by the American Gas Association to drastically tighten up on the requirements for all American Gas Association approved appliances?

Many operators believe that the responsibility for the development of new, and the improvement of present appliances rests entirely on the shoulders of the appliance manufacturers. I cannot agree with this premise. The operating companies are in direct touch with their competition, therefore, the initiative for what will be required must also come from them. Neither can I subscribe to the premise advanced by some manufacturers that the American Gas Association laboratories should not be engaged in development work.

There are 90 manufacturers in this country producing gas ranges. How many of them are financially able to carry on the development work required to offset that of the laboratories of our large competitive equipment manufacturers? And where would you find 90 technicians capable of carrying on such development work? This situation is applicable to the manufacturers of water heaters also. In the final analysis, the operating companies, not the manufacturers, are the real losers if the domestic business is lost. They can sell nothing but gas, whereas, manufacturers can switch to other products should this happen. Some of our manufacturers seem to sense the possibility of the loss of their gas appliance business. Even before the present restriction was placed on the production of appliances, they were hedging by making or planning to make appliances to replace those operated by gas.

Stricter Appliance Requirements

The development of stricter appliance requirements is, of course, a function of the appropriate American Gas Association committee, and the adequate enforcement of such requirements is the responsibility of no other agency but the American Gas Association Laboratories.

In justice to the manufacturers, let me state at this point that many of them have sufficient pride in their products to turn out the best appliances they know how to build. However, they cannot do so if we haggle over the extra cost incurred in manufacturing the best possible product. There is not a single good appliance that cannot be made cheaper by the sacrifice of quality. Those who consider price only are the natural prey for those who would sacrifice quality for increased business. The wonderful success experienced in the sale of gas refrigerators proves conclusively that if the product is right, the retail sales price is of secondary consideration. Encouragement through extensive purchases should be given to those manufacturers who incur added costs to improve their products.

The necessity of revamping our appliance line has been stressed at many sales conferences. Wide awake sales executives see the handwriting on the wall. They know that the required results cannot be attained with the tools that have been given to them to work with. By this I mean the present appliances, instead of new and/or better ones required to meet competition. The past complacency of the industry must be radically changed if our sales departments are to be given a fighting chance after the war. Resolutions will not do it—slogans will not do it—present procedure of our committees will help, but the industry as a whole must take positive action.

I realize that many here will claim that progress is being made in improving our appliances. This is partly true, but the progress is exasperatingly slow. Let me cite just two instances to illustrate this statement—first, a letter written to the American Gas Association by the late Conrad Lauer on March 7, 1935, in which he recommended that the Association consider a list of eight essential improvements to the gas range. Granting that substantial progress has been made on some of the items listed, and to a lesser degree on the other ones, the program as a whole has not been followed out to its logical conclusion. Eight years have passed since the letter was written—surely the recommendations have not been held up for lack of merit. What then is the reason?

Gum Problem Tackled

Second, it is only recently, that many companies would even admit that vapor phase gum existed in manufactured gas to an extent that it seriously interfered with pilot operation. They went blithely along, selling millions of automatic appliances, and, at the same time, incurring a corresponding increase in customer complaints and customer service costs. It has requried many years of constant plugging to secure the sanction of the industry to proceed with a study of gum protective devices for pilot lighting.

It is not too much to state that with the rapid increase in the number of automatic appliances on our company's lines, the situation would shortly have become intolerable from the standpoint of pilot failures, servicing expense and resultant customer dissatisfaction, were it not for the development of the vapor phase gum filter with its practically complete relief from pilot outages.

The existence of the vapor phase gum problem was established as long ago as 1930 and it is only now, in the Fall of 1943, that thanks to President Bridge there is reason to hope for an A. G. A. requirement of an effective remedy. In other words, it will have taken from 13 to 14 years from the time the existence of this major problem was established to institute measures for its effective control. I believe we are entitled to doubt whether, in the post-war period, the industry can expect to have any such magnificent period of time to solve a fundamental problem.

Responsibility for Sales

It is, however, not enough that the manufacturers should make available to us, modern, trouble-free, efficient gas appliances that accreditably represent our fuel. Our customers must be induced to buy these appliances in preference to competitive appliances with claimed superior advantages.

This is the definite responsibility of the operating company and is one that cannot be assigned. It is up to each of us to accept this responsibility, and to take advantage of the post-war selling opportunity to renew our domestic load. The sales opportunity afforded during this period will be unique in the history of appliance marketing.

The limitation placed on the sale of appliances during the war has created a situation wherein we will be faced, in the early post-war period, with the replacement of a considerable part of our domestic appliances. It is the responsibility of every man in the industry to make certain that these worn out appliances are replaced with gas appliances, and not, through our own negligence, make our own territories a happy hunting ground for our competitors. The gas industry developed the modern household appliances after it had lost its lighting load. It is our field and we must protect it.

We cannot look for another miracle to delay the loss of the appliance load, similar to the introduction of the Welsbach mantel when the gas

lighting load started to slip. This means that sales programs, sound in conception and ample in scope, must be ready for execution as soon as appliances are again available. There has been some discussion within the industry as to the post-war policies of many gas utilities regarding merchandising. I have been glad to learn that generally those that formerly merchandised, again plan to do so, and some that had discontinued merchandising, intend to resume.

While these policies are commendable, it is not enough to take up appliance selling where we left off. Instead, we must plan to defend and enlarge our domestic load against the strongest competitive attack. We must provide the necessary advertising, promotion and manpower to insure the continued acceptance of gas as the preferred domestic fuel. There is no reason to expect that this program will be an easy one. Our competitors are laying the same plans to obtain the same market. We must see to it that our plans are the ones that will prevail.

Cooperative Dealer Relations

In the larger cities, it is unlikely .hat the gas utility can do full justice to the post-war market for gas appliances unless its policies permit a cooperative dealer plan that is equal in advantages to the dealer to plans provided by distributors of competitive appliances. In such situations, the sale of gas appliances is tremendously stimulated by a group of active dealers cooperating with the gas utility. Such cooperation can be obtained without financial loss to the utility when a proper distributor and dealer mark-up is placed on the appliances that the utility sells.

This fact must be borne in mind—there will be dealers selling domestic appliances, either gas or competitive, whether we want them to or not. Every dealer we have with us is one less that is against us. They will not only be selling appliances that are on the approved list of the utility, but such sales will reduce to that extent the sales power of our competitors. Let us not, in this post-war competitive sales period, ignore the advantage we can gain from such capable allies. Our objective should not be the profit from the sale of appliances, but to place trouble-free appliances in the homes of our customers, regardless of who sells them.

This discussion would be incomplete without reference to the new home market. It is reasonable to expect that private building will be stimulated during the post-war period, and I regard it as essential to the welfare of our industry that this market be retained.

Whether or not you make any effort to secure this large potential volume of new business, you will secure some of it. Some of it, however, is not the anwer. That part which you do not secure will serve as stepping stones for your competitor to make further inroads on the business you now have.

The loss of the new home market would be extremely costly to the gas industry. We must, at any cost, retain our present strong position in this field. It can be done by showing the same aggressive tactics as our competitors and, where necessary, modifying our policies regarding services and main extensions, so as to make gas service easily available to builders. Let us not win the argument and lose the load in the new home market.

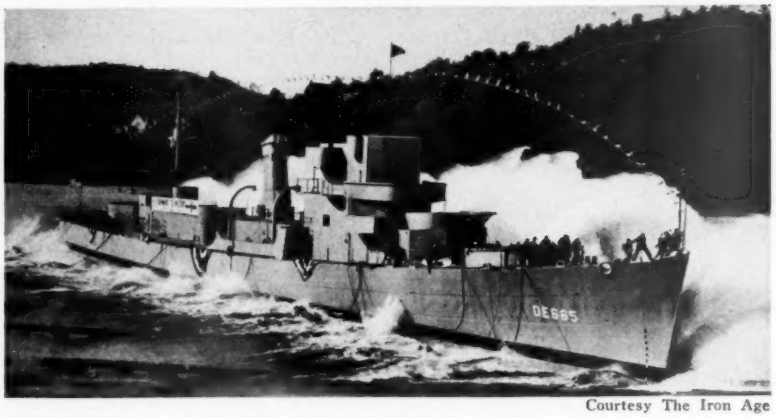
Up to this point, my discussion has referred to the purely domestic market of cooking, water heating and refrigeration. It is important that some consideration be given to gas house heating as well. While it is admittedly less attractive from an average rate and load factor standpoint, it does have several important advantages to recommend it.

Gas house heating is, in effect, the keystone of the domestic load arch, in that it ties together and strengthens the other uses of gas. In many cases, particularly in new homes without house heating, only gas cooking is obtained, but where gas heating is used, water heating is brought along with it, and a ready market is provided for gas refrigeration. When recognition is given to the added water heating and refrigeration load, and particularly where the small home market is sold gas heating, both the load factor and revenue are made comparatively attractive.

This is particularly true if a practical summer-winter hook-up for water heating is developed that can be economically used by both large and small customers. In addition, gas heating is recognized by our customers as dramatic and shares with gas refrigeration the distinction of being a "modern" fuel application. In an industry that our competitors would attempt to relegate to the horse-and-buggy days, it is essential that we strongly promote these gas applications that our customers consider smart and novel.

(Continued on page 510)

Navy's Newest Named for Gas Man



Courtesy The Iron Age

Sliding off the ways at the Pittsburgh yards of the Dravo Corp., is the U.S.S. Jenks, *first of the new type destroyer-escorts. It was named after Lt.(jg) Henry P. Jenks of White Plains, N. Y., who lost his life in the Solomons last November. Lt. Jenks was well known in the commercial gas utilization field as field representative and part owner of the Fenton Kelsey publications, "Cooking for Profit," "Baking for Profit," etc.*

Improved Apparatus . . . *for the Rapid Determination of Carbon Monoxide*

PART II

DEVELOPMENT OF A PORTABLE IODINE PENTOXIDE APPARATUS

- In Part I of this paper which appeared in the October issue of the A. G. A. MONTHLY, a brief description of the properties and physiological behavior of carbon monoxide, and various general procedures for the detection and determination of carbon monoxide were considered. Then followed the story of the development of a portable apparatus for the rapid determination of traces of carbon monoxide in various atmospheres.
- In Part II, the development, description of the apparatus, the procedure for its operation, and experimental results are presented.

By LOUIS SHNIDMAN

Rochester Gas & Electric Corporation, Rochester, N. Y.

IN 1928 our laboratory was confronted with the problem of determining the presence of small quantities of carbon monoxide, that is, less than 0.1 per cent in various types of gas mixtures. Since the usual Orsat-type apparatus will show the presence of carbon monoxide only within 0.1 to 0.2 per cent, some other method and apparatus were required. Accordingly, a search of the literature for suitable methods was conducted. A study of the available procedures for the determination of traces of carbon monoxide was made. A brief discussion of some of these procedures has been presented in an earlier part of this paper.

We were interested in securing or developing an apparatus that would be suitable for analyzing various types of gas mixtures; one that could determine quantitatively traces of carbon monoxide which might occur from leaks about the plant; in atmospheres of enclosed plant equipment where men would be required to make repairs; in combustion products from various types of apparatus and equipment for a check of their efficiency; and in the atmosphere and flue products from gas equipment on consumers' premises relative to leaks or improper combustion. After due consideration of the various procedures available, it was decided that an apparatus based upon the reaction of carbon monoxide with iodine pentoxide would be best adapted for our purposes.

$$I_2O_5 + 5CO \rightarrow 5CO_2 + I_2$$

Previous studies by other investigators including Berry[34] of the U. S. Bureau of Standards, Burrell[35] of the Bureau of Mines, Davies and Hartley,[20] and others have shown that the iodine pentoxide procedure was capable of detecting and determining traces of carbon monoxide to a high degree of accuracy. The various procedures developed differed mainly in the system for purifying the gas to remove interfering constituents; the temperature at which the iodine pentoxide was maintained; the method for purging the apparatus; and in the procedure adopted for determining the amount of carbon monoxide present; i.e., whether the iodine liberated or the carbon dioxide formed was measured.

With these basic ideas in mind a portable apparatus was developed in the early part of 1929. The apparatus consisted of a 200 ml. sampling tube and leveling bottle, a purifying train containing concentrated sulphuric acid, chromic acid, and calcium chloride, a small iodine pentoxide tube immersed in oil in a thermos bottle and heated electrically, potassium iodide absorption tube, followed by a second 200 ml. container and leveling bottle. All the equipment was housed in a wooden container approximately 12 inches high, 12 inches wide, and 6 inches deep. In its operation a sample of gas was passed from the first container through the apparatus to the second container and the sample recirculated several times. This apparatus served our general purpose but possessed several disadvantages: The time required for a determination was one hour or more, discrepancies in the results were encountered on occasions, and the apparatus would only detect carbon monoxide in amounts down to 30 parts per million.

In 1934 the apparatus was completely redesigned incorporating the benefits of our previous experience and the work carried out by Vandaveer.[21] The apparatus has been improved from time to time so that the photos, Figures II, III, and IV, show the apparatus as at present. It is a sturdy, compact, and portable outfit as shown in Figure V.

Description of Apparatus

As indicated in the photographs, Figures II, III and IV, the equipment is housed in a wooden carrying case measuring approximately 14 inches by 9 inches by 16 inches. The top and front sections are hinged and are readily opened for a test. The front door is also removable.

The apparatus consists of a 500 ml. gas container (1), a purifying system containing three side arm spiral scrubbers (2, 3, 5), and a U-tube (6); and I_2O_5 tube (7) enclosed in the heating chamber (7^B); an absorption tube (8), and a diaphragm pump (9), all connected in series as a closed system.

PURIFYING SYSTEM: The purifying system for removing water and interfering substances consists of the three side-arm spiral scrubbers (2, 3, 5). Figure VI is a photo of the scrubber showing details. The scrubber is filled as shown, and in its operation gas enters at the left, passing down through the narrow tube to the inner capillary. Then the gas passes through the capil-

lary in a stream of fine bubbles which entrain liquid and then pass up through the glass spiral resulting in circulation of the liquid. The first scrubber (2) is filled with concentrated sulphuric acid. The next scrubber (3) which is not visible in the photograph is filled with chromic acid for removing unsaturated hydrocarbons, aldehydes, and related compounds. It is maintained at 100° C. (212° F.) in the asbestos insulated box. Heat is supplied by a 25-watt elongated bulb covered with tin foil, connected to a thermostat on the inside which maintains the temperature constant. External regulation of the temperature is controlled by knob (11). The third scrubber (5) is filled with concentrated sulphuric acid. Between the second and third scrubbers a three-way stopcock (4) is inserted which permits venting the system to the atmosphere when the apparatus is not in use. After the last scrubber is placed, the U-tube (6) is filled with potassium hydroxide pellets and Dehydrite. This tube removes any acid vapors and the final traces of water vapor carried along with the gas.

IODINE PENTOXIDE: The iodine pentoxide is contained in a Pyrex U-tube (7) which is 6 inches long, ⅜ inch outside diameter, alternately filled with ½ inch layers of glass wool and iodine pentoxide. Capillary tubing was seated to the end of the tube as shown in the photos. The exit arm of the tube contains a special ground glass joint (7^A) which joins with the potassium iodide absorption tube (8). The tube is placed in the electrically heated air chamber (7^B) and maintained at a temperature of 150° C. (302° F.). This chamber consists of a rectangular box approximately 4½ inches by 3½ inches by 8 inches, made out of transite board, inside of which is inserted a smaller metal box approximately 3½ inches by 2½ inches by 7 inches. Chromel wire is wound on the insulation of the inner box and is fixed in place with asbestos cement. The space between the two boxes which measures about ½ inch is filled with rock wool. A transite board cover is provided for the chamber. The temperature is set manually by the lever (15) and is controlled by a bimetallic thermoregulator within (7^B) which is connected to (15). A Tattelite Electrical Tester (17) connected across the contact points of the thermostat indicates when the iodine pentoxide tube (7) is up to the proper temperature.

POTASSIUM IODIDE ABSORBER: The potassium iodide absorption tube (8) consists of a Pyrex glass test tube approximately 7 inches in length and about ¾ inch inside diameter into which is inserted a specially designed bubbler tube to give maximum contact of liberated iodine with the potassium iodide solution. Inserted in the bubbler itself near the top is a floating check-valve which prevents any of the potassium iodide solution from being sucked back into the iodine pentoxide tube when the apparatus is shut off. Figure VII shows this scrubber in detail.

The solid glass rod in the form of a spiral wound around the bubbler tube disperses the gas as it bubbles through the potassium iodide solution.

CIRCULATING SYSTEM: An Ace Aerator, 110 volt, 60 cycle diaphragm pump (9) connected between the potassium iodide absorption tube (8) and the container (1) provides circulation for the equipment. This pump, which is merely a common aquarium aerator, proved adequate giving a circulation rate of 200 ml. per minute. In this paper a run is a test period of 15 minutes, and for each additional run another 15-minute period of circulation is made. A G.E. timer (10) controls the period of test and automatically shuts off the pump.

The usual procedure, as developed by other investigators, has been to use nitrogen or CO-free air to purge out the apparatus before a test run is made and also to carry out of the iodine pentoxide tube all of the liberated iodine during a test. The principle of the apparatus herein described is to continuously circulate the unknown atmosphere through the system, as described above, by means of the diaphragm pump at the rate of 3000 ml. per run (15-minute test period). Thus, once the apparatus is purged out, contamination with any atmospheric carbon monoxide or from purge gas, as reported by Roberson[2] is avoided.

MISCELLANEOUS: A trap (12) with a two-way stopcock is installed on the left side wall of the outfit between the gas sampler and the first acid scrubber. This serves as a receptacle for any acid which might back up from the first scrubber when the outfit cools down to room temperature. It also serves as a point where an air line could be readily connected to the apparatus for that type of a purge. This will be explained later under procedure for analysis.

The 500 ml. gas container (1) is located in such a way that it can be removed very easily for filling, by water displacement, with the atmosphere to be tested. In cases where the carbon monoxide content is known to be high, a smaller sample may be used, and containers of 150 ml. and 250 ml. capacity are provided which fit in the same place.

All of the electrical connections terminate at one plug which is located on the lower right side of the apparatus box. An extension cord (14) is provided for connecting

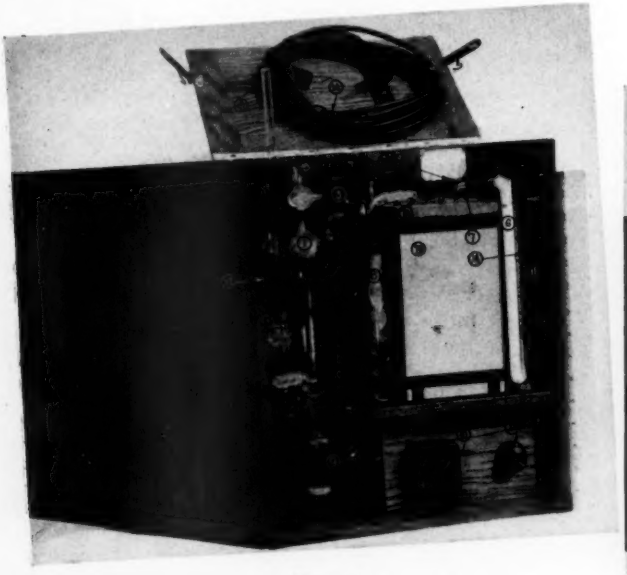
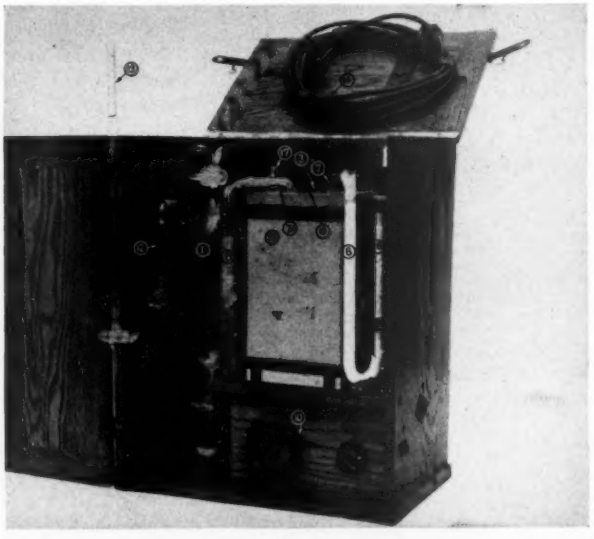


Figure 2

Figure 3



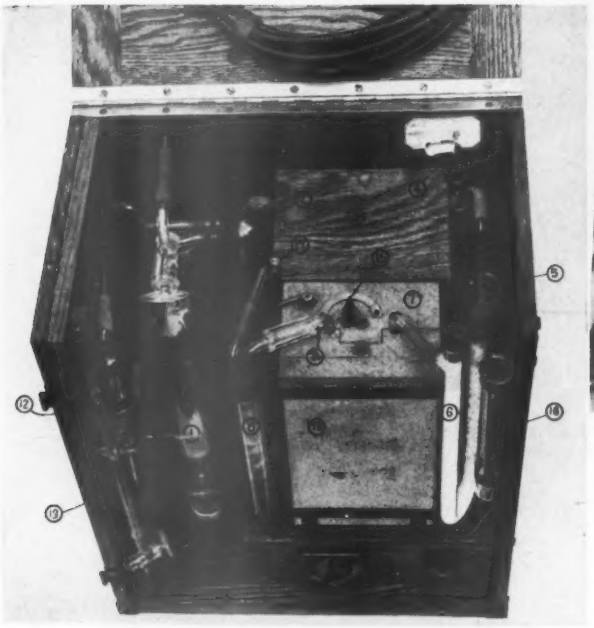


Figure 4

Figure 5

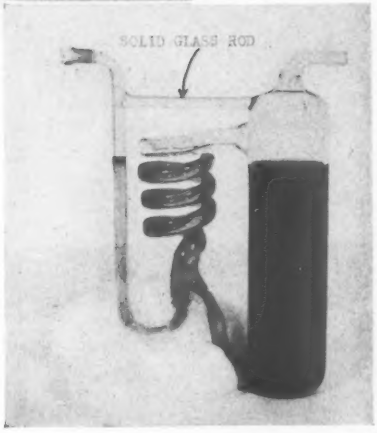


Figure 6

to A.C. current. In transporting the apparatus, this cord is conveniently held on the under side of the top cover by means of three metal hooks.

For titrating with thiosulfate, a 10 cc. burette (13) calibrated in .05 cc. divisions is fastened to a movable section of the carrying case on the left side as can be seen in the photograph. An extra absorption tube (16) is carried in the case.

Procedure for Analysis

The apparatus must be purged thoroughly before using, and we have followed the practice of running a blank before and after passage of the gas sample as recommended by Davies and Hartley.[20] To purge replace the 500 ml. container (1) with the L-shaped section of glass tubing provided for the purpose. This permits purging the apparatus without the gas sampler connected in the system. Connect to the A.C. line and allow the heating chambers to reach their respective temperatures. It will require about one hour's time to reach the purging temperature. The purging temperature of the iodine-pentoxide tube is 190° C. (374° F.). The chromic acid scrubber (3) is kept at 100° C. (212° F.). Fill the potassium iodide tube (8) with 15 ml. of freshly prepared solution and insert it in its proper place as noted in the photograph. Close the vent (4) to the atmosphere and adjust the stopcock on the trap (12) so that the gas flow will follow through the acid scrubbers. Then turn the timer (10) past the second click and set for a fifteen-minute purge. This will permit the removal of any of the partially decomposed oxides of iodine which may have accumulated in the iodine-pentoxide tube on standing. Any liberated iodine is absorbed in the potassium iodide solution. The system is closed and thus permits the recirculation of the atmosphere within the apparatus itself. Usually one run is adequate. The iodine-pentoxide heating chamber (7) is then set at 150° C. (302° F.) at which temperature the reaction of carbon monoxide with iodine pentoxide is rapid and complete. It is important to make certain that the iodine pentoxide has dropped to 150° C. (302° F.). A hole in the top of (7^B) is provided for the insertion of a thermometer to check this temperature.

A sample of the atmosphere to be tested is drawn into the container (1) by the usual water displacement method. The gas is then brought to atmospheric pressure by opening and closing the upper stopcock rapidly several times. No further temperature or pressure corrections are made in routine analysis, but such corrections should be considered when greater precision is required. The sampler is then connected in its usual place. Fresh potassium iodide solution is placed in the absorption tube (8). The pump (9) is turned on to run for a fifteen-minute period. From this point on the apparatus requires no attention, since it will run for the period set and will shut off automatically. The absorption tube is removed and replaced with another one, and the pump set for another run of fifteen minutes. During this time, any blue coloration, after the addition of starch indicator to the first solution, is titrated with .001 N sodium thiosulfate using the ten cc. burette (13). The resultant solution from the second fifteen minute run is treated in like manner. At the completion of a test, a glass plug is inserted in the outlet tube of the iodine-pentoxide tube in order to prevent any moisture being sucked back into the

tube upon cooling to room temperature.

The apparatus requires a reasonable amount of care. It has been our practice to use rubber tubing for connections except between the iodine-pentoxide tube and the absorber which is a ground glass joint. We have encountered no difficulty due to the use of rubber tubing as also found by Davies and Hartley.[20] The scrubbers will require changing periodically depending upon the number of analyses made. The motor will require oiling from time to time and the electrical connections should be inspected to make sure they are secure. The iodine-pentoxide tube has given little or no trouble, but precautions should be taken to make certain that none of the absorbing liquid can suck back into the iodine pentoxide. Since most of the apparatus is constructed of glass, due care should be given not to abuse it during handling.

Experimental Results

In order to determine the efficiency of the purifying train ahead of the iodine-pentoxide tube and in turn the accuracy of the apparatus as a whole, various gas-air mixtures of known carbon monoxide content were made up and tested. Three gases, each containing certain proportions of carbon monoxide, were diluted with air. The analysis of these gases are presented in Table III.

Pure carbon monoxide was made by dropping pure formic acid upon warm concentrated sulphuric acid. The gases evolved were scrubbed with 60 per cent potassium hydroxide solution and stored in a bottle over water. Carbon monoxide was determined in this mixture by combustion with excess oxygen followed by absorption of the carbon dioxide formed. This was proved to be essentially pure carbon monoxide.

The manufactured gas used was from the production lines and was stored in a small holder. Samples of this gas were taken for analysis and dilution. The carbon monoxide was determined by the regular absorption method.

The flue gas was made by forcing a large bunsen flame to burn inside a length of half inch pipe, which was bent in such a way that the products of combustion were slowed down in passing through it. This resulted in a partial combustion of the gas and carbon monoxide was formed. The gas was stored over water and samples of this mixture were taken for analysis and dilution. The carbon monoxide was determined by the regular absorption method. The dilutions of these three gases with air were made in large glass bottles and these mixtures were checked within an hour or two by using the iodine-pentoxide apparatus described previously. The dilutions used and results obtained are presented in Table IV.

The data presented in Table IV indicated that the accuracy of the apparatus was somewhat dependent upon the type of gaseous atmosphere being analyzed. The determined carbon monoxide concentrations were about 5 per cent lower than the calculated values for air-pure carbon monoxide mixtures or flue gas-air mixtures. For manufactured gas-air mixtures the results were about 5 per cent high. These results indicated that the purifying train was removing possible interfering substances in a satisfactory manner. For all practical purposes this apparatus can be expected to yield results within 5 per cent of the true carbon monoxide content of the gas analyzed.

All of the iodine pentoxide results

(Continued on page 522)

TABLE III

	Analysis of CO Containing Gases		
	Pure Carbon Monoxide	*Manufactured Gas*	*Flue Gas*
CO_2	0.0%	3.2%	5.6%
Ill.	0.0	3.8	0.0
O_2	0.0	0.0	0.1
CO	100.1*	10.1	8.6
H_2	—	44.8	9.1
CH_4	—	26.5	1.2
N_2	—	11.6	75.4

Note: *Average of 3 samples.

TABLE IV

COMPARISON OF ACTUAL CARBON MONOXIDE, BY DILUTION OF A KNOWN GAS MIXTURE, WITH CARBON MONOXIDE OBTAINED WITH IODINE PENTOXIDE APPARATUS

Results Expressed in Parts per Million

I *Pure Carbon Monoxide-Air*		II *Manufactured Gas-Air*		III *Flue Gas-Air*	
Actual CO	*CO by I_2O_5*	*Actual CO*	*CO by I_2O_5*	*Actual CO*	*CO by I_2O_5*
1130	1120	1127	1187	1004	968
110	106	110	116	98	96
13	12	13	17	12	13
3	Color Visible	3	Color Visible	2	Color Visible
1	Blank	1	Blank	1	Blank

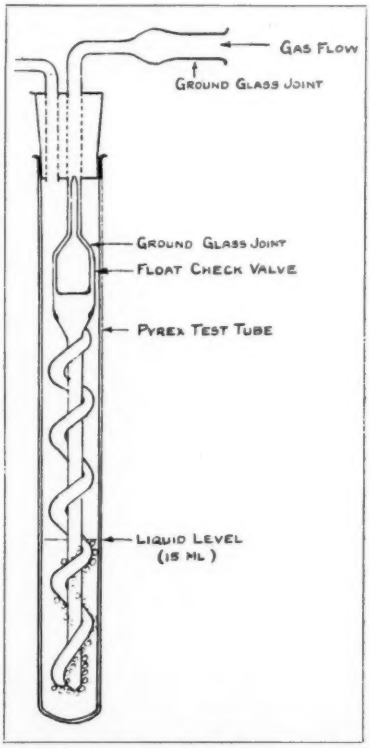


Figure 7. Potassium iodide absorption tube

Personal AND OTHERWISE

Robinson Appointed War Activities Chairman

J. French Robinson

ERNEST R. ACKER, president of the American Gas Association, has announced the appointment of J. French Robinson, president of The East Ohio Gas Company, Cleveland, as chairman of the Association's vital Committee on War Activities. Mr. Robinson, a vice-president of the Association, succeeds Mr. Acker as head of this committee whose function is to coordinate the gas industry's war effort.

Mr. Robinson is exceptionally well qualified to fill this post as he has been in close touch with governmental agencies in several official capacities. He is a member of the Petroleum Industry War Council and general chairman of the Natural Gas and Natural Gasoline Committees under the Petroleum Administration for War. He is also chairman of the Natural Gas and Natural Gasoline Committee of PAW District No. 1.

He served as chairman of the Natural Gas Section, American Gas Association, in 1941-1942.

Columbia Gas Elects Crocker President

S. M. Crocker

S. M. CROCKER was elected president of the Columbia Gas and Electric Corporation at a meeting of the board of directors November 12, it was announced by Philip G. Gossler, board chairman. Mr. Crocker succeeds Edward Reynolds who is retiring to devote full time to his duties as administrative head of the Supply Division, Office of the Surgeon General of the Army, which position he has occupied since November, 1942, under leave of absence from the corporation.

Mr. Crocker has resigned as vice-president of the General Electric Company to take over the presidency of the Columbia Company.

Mr. Crocker was born at Cambridge, Mass. May 26, 1898, graduated Harvard in 1921, and served with Radio Corporation of America until 1922, when he joined the General Electric Company as assistant to Owen D. Young, chairman of the board. In 1927 he became vice-president and treasurer of United Electric Securities Company. He was elected vice president of National General Electric Company in 1930, and appointed assistant to Charles E. Wilson, then executive vice-president of the parent company in 1938. He was elected vice-president of General Electric in 1940, and since Pearl Harbor, he directed the company's electronic production for the Armed Forces at Syracuse, N. Y.

Columbia Gas and Electric Corporation owns and operates natural gas and electric properties serving directly 1,229,000 gas consumers and 407,000 electric consumers.

Thuerk Elected President of New Jersey Utility

H. C. Thuerk

H. C. THUERK has been elected president and a director of the New Jersey Power & Light Company, according to an announcement made November 10. He was formerly president of the Bradford Electric Company, prior to which he was a member of the staff of the Atlantic Utility Service Corporation, New York.

Since his graduation from Purdue University, Mr. Thuerk has had wide experience in public utility affairs in the commercial, industrial, sales and engineering branches of the business. He has been an active member of the American Gas Association, serving as chairman of the Community Development Committee for two years ending in 1941. He became president of the Bradford Electric Company on April 15, 1941.

U. G. I. Director

THE United Gas Improvement Company announced November 23 that William M. Hickey, president, The United Corporation, had been elected a director of the company, to fill a vacancy on the board.

Hartson Presents McCarter Medal to Foreman

FOR saving the life of a three-year-old boy, F. D. Wright, District Foreman, Division C, of the Equitable Gas Company, Pittsburgh, Pa., was recently awarded a McCarter Medal by the American Gas Association. The medal was presented on September 27 by D. P. Hartson, vice-president and general manager of the company. At the same time, Mr. Hartson presented Mr. Wright with fifty dollars on behalf of the Equitable Gas Company.

Mr. Wright received this high honor for his action on Sunday, January 10, 1943, when three-year-old Joseph Hagmaier of 109 13th St., Sharpsburg, Pa., was found unconscious in the living room of his home. Respiration had ceased and Mr. Wright, who lived next door, was called. He immediately began using the Schafer prone pressure method of resuscitation which proved effective. Joseph's breathing was restored in 15 minutes.

When the doctor arrived, he diagnosed the incident as a case of carbon monoxide poisoning from an unvented heater.

The McCarter awards are made by the Association's Executive Board on recommendation of the Accident Prevention Committee. Mr. Hartson, who made the presentation, is a past chairman of the A. G. A. Technical Section.

D. P. Hartson (right), vice-president and general manager, Equitable Gas Company, presenting F. D. Wright, district foreman, Division C, with a McCarter Medal for saving the life of little Joseph Hagmaier (left), while General Superintendent T. H. Kendall looks on

Ayers Named Chairman of Personnel Committee

L. M. AYERS, industrial relations manager of The Peoples Natural Gas Company, Hope Natural Gas Company, and The East Ohio Gas Company, has been appointed chairman of the Personnel Committee of the American Gas Association it has been announced by Ernest R. Acker, president of the Association.

The Personnel Committee is now in its eighth year as an Association activity and is engaged in a continuing study of the industrial relations problems of the gas industry. At present, it is devoting particular attention to methods of alleviating the manpower shortage and contributing to the effective prosecution of the war.

The new committee chairman, Mr. Ayers, is a recognized authority on industrial relations. He is a native of West Virginia and received his education in Teacher's Training School. After teaching school for five years in West Virginia public schools, in 1913 he became an oil and gas leaser in West Virginia for the Greensboro Gas Company, later acquired by the Columbia Gas and Electric Corp.

Subsequently, Mr. Ayers was employed by the South Penn Oil Company in 1916, the Guffey Gillespie Oil Company, Tulsa, Okla., in 1920 and the Carter Oil Company, Tulsa, in 1921. He was transferred to Pittsburgh, Pa., in February, 1926, as industrial relations manager of The Peoples Natural Gas Company in Pennsylvania, The Hope Natural Gas Company in West Virginia, and The East Ohio Gas Company in Ohio.

Brundage Gets New York City Post

H. M. Brundage

H. M. BRUNDAGE, New York regional director of the Smaller War Plants Corporation and former gas industry sales executive, was appointed Commissioner of Markets of New York City November 17 by Mayor F. H. LaGuardia, succeeding Daniel P. Woolley, Jr.

A graduate of Stevens Institute of Technology, Hoboken, N. J., Mr. Brundage is widely known in the gas industry for his sales work with Consolidated Edison Co. of New York, Inc., Standard Oil Co. of New York, and Washington Gas Light Company. He resigned as sales manager of the Washington gas utility in 1939 to operate his own gas refrigerator distribution firm in Richmond, Va.

When war priorities cut off stocks, he joined the War Production Board as chief of its appliance branch. After holding various other posts in WPB, he became deputy regional director in charge of priorities and materials for New York and northern New Jersey in August, 1942. In this capacity, he administered emergency fuel oil regulations last winter. Last spring he was named regional director of the Smaller War Plants Corporation.

While in the gas industry, Mr. Brundage was a member of the National Advertising Copy Subcommittee and other committees of the American Gas Association.

Philadelphia Utility Tells War Story

STOCKHOLDERS of the Philadelphia Electric Company recently received an illustrated two-color booklet, "Facing the Future," outlining the company's facilities and outstanding service during the war. Complete with animated charts, striking photographs and statistical analyses, the publication gives a graphic account of utility service under emergency conditions.

Philadelphia Electric serves gas in four counties adjacent to Philadelphia but not in the city itself, and also sells gas to local companies serving Wilmington, Del., and Reading, Pa. Manufacturing capacity of the company's gas production plants is 53,400,000 cubic feet daily. In addition, it purchases up to a maximum of 17,500,000 cubic feet of gas each day.

Comparing power requirements of the first world war with those of the present conflict, the booklet points out that today the "peak electric load is eight times the peak of the first world war and the gas demand is five times greater." Almost 1,000 of the company's employees have joined the armed forces.

Gas Advertising Media List Expanded

THE American Gas Association's Committee on National Advertising has added House Beautiful, House & Garden, True Story, Parents', Architectural Forum and American Builder and Building Age to its media list, now extended to the end of 1944.

The basic list of magazines presently being used consists of Saturday Evening Post, Life, American Home, Better Homes & Gardens, Ladies' Home Journal and Good Housekeeping.

The first insertions in the new magazines added to the list will appear in House & Garden for January, 1944 and the February issues of True Story, Parents' and House Beautiful. Advertisements in Architectural Forum and American Builder and Building Age will start with the July, 1944 issues of those magazines.

Portland Veteran's Club Growing

Enjoying the Portland (Ore.) Gas & Coke Company Veterans' Club party are, from left: Paul B. McKee, company president, and two directors, Frank Ransom and John Laing

FORTY-THREE new members inducted into Portland (Ore.) Gas & Coke Company's Veterans' Club meeting recently swelled the membership to 429. Singled out for an extra vigorous initiation was Paul B. McKee, company president, who recently completed his tenth year of service.

J. C. Ryan, 42-year veteran from the utilization bureau, and C. H. Sundby, 37 years in the production bureau, supervised Mr. McKee's induction as the "baby" member of the club.

George Mackenzie, assistant treasurer of the company and a 25-year veteran, acted as master of ceremonies, sketching the company's 84-year history from the days when covered wagons were still deepening the ruts of the Oregon Trail.

Sixty-three per cent of the company's people have ten years or more of service to their credit. Oldest member in point of service is Ah Lee, with 46 years, whose Chinese countrymen were accorded a special tribute for the valiant stand they are making against the Japs.

The 35-year class of company veterans now has 21 members and there are 40 in the 30-year class. Quarter-century veterans number 47. Largest group is the 20-year class with 145, followed by the 15-year class with 131.

Gas Conditions in Germany

THE Mayor of Neumunster has announced that taps on gas meters must be kept closed for the reason of safety, and that any attempt to use gas is strictly forbidden and that offences will be punished as crimes. Presumably this order arises out of havoc to gas mains wrought by R.A.F. bombing.

In Schleswig-Holstein gas consumption has increased and consumers have been informed that if they wish to avoid restrictions they must immediately reduce the quantity of gas they are using. It is suggested that geysers be used only when ab-

solutely necessary and that gas rings should be carefully watched as they are often left burning.

In Nuremburg, it is learned, havoc caused by the last R.A.F. raid is gradually being repaired. The Mayor has just announced that in certain parts of the town gas supply will shortly function. Day by day the newspapers publish the names of districts where supply is back to normal. In Essen the same situation obtains with the difference that those sections of the two where the taps are again open, varying to low pressure only can be promised.—"The Gas World," London, October 16, 1943.

Air Conditioning Group Forms

ORGANIZATION of the Indoor Climate Institute, devoted to the improvement of heating and air conditioning, was announced in Detroit Oct. 4 by leading manufacturers in the heating, cooling and equipment industries.

The group will serve as a clearing house of information on all types of heating and air conditioning. It is proposed to establish local chapters throughout the country, made up of members of the trade, including dealers and utility companies.

Paul B. Zimmerman, of the Airtemp Division, Chrysler Corp., Dayton, was elected president of the institute. Among the directors elected are W. J. Grover, Surface Combustion, Toledo, Ohio; John Knighton, Servel, Inc., Evansville; C. D. Lyford, Minneapolis-Honeywell Regulator Co., Minneapolis; J. R. Scott, Mueller Furnace Co., Milwaukee; and W. L. Seelbach, Forest City Foundries Co., Cleveland.

Nomination Sidelight

PERHAPS it is the effect of the war and the shortage of manpower. Or it could have been a move to add sex appeal to an ancient and honorable industry. Then again it might have been the germ of a serious idea to emancipate the women of the gas industry.

Whatever it was, a bit of humor was injected into the usually solemn and dignified occasion of nominating officers of the American Gas Association.

When making the report of the General Nominating Committee, H. R. Cook of Baltimore stated that some consideration had been given to putting up an opposition slate. As the delegates pricked up their ears, Mr. Cook went on to say that the slate in mind was:

Billie Burke for president.
Jessie McQueen for vice-president.

However, he continued, serious thought prevailed and the original selections would stand unopposed.

Doubtless the committee was influenced by the success of the Home Service Breakfast.

Mid-Southeastern Gas Meeting

MORE than 100 persons attended the highly successful fifth annual meeting of the Mid-Southeastern Gas Association which took place Nov. 19 at Hotel Sir Walter, Raleigh, N. C. R. L. McCuen, president of the Association, presided at the meeting which stressed war and post-war responsibilities of the gas industry. The College Extension Division and Department of Chemical Engineering, North Carolina State College acted as co-sponsors of the event.

E. J. Meade, vice-president of the Florida Public Utilities Company and of the Atlanta Gas Light Company, was elected president for the new term. Other new officers are: first vice-president—J. S. Rider, Sumter Gas and Power Co., Sumter, S. C.; second vice-president—A. L. Jones, Tide Water Power Co., Wilmington, N. C.; secretary-treasurer—Edward W. Ruggles, North Carolina State College (re-elected).

New directors elected at the meeting are: F. K. Toney, Combustion Engineering Co., Chattanooga, Tenn.; Al Westcott, Roanoke Gas Co., Roanoke, Va.; and J. M. Purcell, City of Richmond, Richmond, Va.

Particularly timely were talks by government representatives covering war problems. Alexander Macomber, director, Manufactured Gas Division, Office of War Utilities, War Production Board, outlined the national conservation program and its application to the gas industry. He also presented the outlook for securing oil for gas-making and expressed the opinion that an adequate amount would be made available for this purpose. He noted that the manufactured gas industry is operating at an over-all load factor of 80 per cent, which is considered very satisfactory.

F. M. Kimball, also of the Office of War Utilities, followed Mr. Macomber with a description of OWU procedure in considering applications for increasing gas service under Order L-174.

Post-war aspects of the gas business were dealt with by three speakers: J. K. Knight, research engineer, Servel, Inc., who described the all-year air conditioning unit developed by that company for post-war development; William J. Foster, George D. Roper Corp., who spoke on post-war appliance selling; and John W. West, Jr., assistant managing director, American Gas Association, who presented a summary of the Association's post-war program.

Dr. E. E. Randolph delivered the address of welcome and the meeting closed with an open forum discussion led by C. B. Zeigler. Considerable discussion developed during the open forum regarding the manpower problem and need for job classification standards.

A banquet was held at 7:00 P.M. at which John Paul Lucas, Jr., was toastmaster and R. Gregg Cherry was the principal speaker.

Pennsylvania Gas Men Discuss Post-War Problems

W. G. B. WOODRING, president of the Pennsylvania Gas Association, announced November 19 at the Barclay Hotel, Philadelphia, during the organization meeting of the New Business Committee of the Association, that a series of meetings will be scheduled to discuss the preparation of a comprehensive program of merchandising and promotional activities for the post-war period.

George L. Cullen, manager, new business department, Harrisburg Gas Company, and a member of the Residential Section's Managing Committee of the American Gas Association, has been appointed chairman of a twelve-man committee of sales executives associated with Pennsylvania gas companies, as well as representatives from several of the gas appliance manufacturers.

CONVENTION CALENDAR

DECEMBER

Dec. 3 **American Society of Mechanical Engineers**
New York, N. Y.

6-10 **National Association of Manufacturers**
Waldorf Astoria Hotel, New York, N. Y.

1944

FEBRUARY

Feb. 9-11 **American Management Association**
Chicago, Ill.

MARCH

Mar. 30-31 **A. G. A. War Conference on Industrial and Commercial Gas**
Rochester, N. Y.

APRIL

Apr. 3-5 **American Society of Mechanical Engineers**
Birmingham, Ala.

MAY

May 8-11 **National Fire Protection Association**
Philadelphia, Pa.

24-25 **American Management Association**
New York, N. Y.

POST-WAR NEEDS

(Continued from page 502)

We possess certain fundamental advantages, such as lower maintenance cost, greater speed and greater flexibility. In connection with the retention of our basic load, it is important that these advantages be developed to their utmost.

At the same time, it is of equal importance to take steps to eliminate certain unfavorable characteristics that are still present in both gas and gas appliances. Such steps would include the elimination of organic sulphur in manufactured gas to get rid of its corrosive effects; the general application of filters to gas appliances to prevent pilot outages with resulting interruptions in the performance of automatic equipment; and the elimination of gas range burner designs and materials which do not have a life equal to that of the range.

Since the day is passed—if it ever existed—when the gas industry had its load by Divine right, it must, in my opinion, take both of these approaches; that is, improve further our advantages, and control and eliminate those factors which we today recognize as handicaps to the continued advancement of gas as a domestic fuel.

United Efforts Needed

To prepare for the post-war period will require the united efforts of the appliance manufacturers, operating companies and the American Gas Association. No single agency can do the work alone. It will require time, and the time is short. I suggest the following program for your consideration:

(a) To improve all appliances to an extent that service failures will be down to an irreducible minimum.

(b) The development of one point ignition on all gas ranges. This in turn will eliminate all thought of electric oven ignition which, if extensively used, would be followed by electric top burner ignition and finally followed by the complete electric range.

(c) Encourage some manufacturers, or a combination of manufacturers, to develop a complete line of ranges, water heaters, house heaters, refrigerators, air conditioners and freezing units so that the volume of their business will be large enough to permit extensive national advertising, as well as continuous research on new and improved appliances.

(d) Drastically tighten up on our American Gas Association requirements to eliminate poorly constructed and troublesome appliances from the national markets.

(e) Strict enforcement of the use of gum protective devices for pilots and small flows on all American Gas Association approved appliances that are sold in manufactured gas territories.

(f) Extensive and continuous research and development in the American Gas Association Laboratories. All such work should be for the sole purpose of improving or developing 100% gas appliances.

(g) Continue with a definite program for finding an economical method of removing sulphur from manufactured gas.

(h) Abrogate once and for all the present custom that American Gas Association major requirements must be applicable to both natural and manufactured gas, when there is substantial reason for having separate requirements.

(i) Continue our national advertising program and obtain more effective promotion of gas appliances through other agencies, stressing the advantages of all gas appliances rather than one specific type of range.

(j) The appointment, to the A. G. A. Staff, of a fully qualified sales representative whose full time would be devoted to the promotion of domestic gas appliances, and contacting household magazines and national advertisers of home appliances for the purpose of promoting the use of domestic gas.

(k) Revise sales policies and plans that were in effect before the war in view of the keenly competitive sales situation that we can expect in the post-war period.

(l) Resolve to obtain for gas the new home market in not only cooking, but water heating, house heating and refrigeration.

To me, this suggested program would be a start on a job that must be completed at an early date if the industry is to continue as a going concern.

In conclusion, let me state that I realize there is nothing thrilling about this program I have recommended. You can undoubtedly find many more glamorous subjects to discuss, but I challenge you to find one that is more necessary to the continued successful operation of our companies. Based upon our past speed, we cannot start too soon.

Cribben & Sexton Plays War Role

AMERICA'S gas appliance manufacturers are playing an important role in the swelling production of implements of war. Many of them were foremost to convert their plants from peacetime production of gas ranges, refrigerators and other appliances to the manufacture of vital parts for airplanes and munitions of war. This notable fact was underlined again recently when officials of the Cribben and Sexton Company of Chicago shared the speakers' platform at the dedication ceremonies of the new Higgins aircraft plant in New Orleans, La.

Photographed at the dedication of the new Higgins Aircraft plant—left to right: James J. Marcus, Cribben & Sexton Co.; Andrew Jackson Higgins, New Orleans; John E. Bogan, Cribben & Sexton Co.

Cribben and Sexton, peacetime makers of Universal gas ranges, in addition to holding other war contracts, is building parts and sub-assemblies for the C-46 Commando airplane produced by Curtiss-Wright. The Higgins Aircraft Corp., subsidiary of Higgins Industries, Inc., was recently awarded a government contract to build the C-46 to supplement production of this new cargo airplane.

Consequently, when the new Higgins aircraft plant was dedicated in New Orleans Sunday, October 24, officials of Cribben and Sexton, John E. Bogan, war contract coordinator and general sales manager, and James J. Marcus, southern representative, took part in the program. Among the speakers at the impressive dedication were: Hon. Sam H. Jones, Governor of Louisiana; Col. B. L. Boatner, Wright Field; Major J. H. Carry, Mobile Air Service Command; W. E. Joyce, vice-president, Defense Plant Corp.; Brig. General K. B. Wolfe, Army Air Force, and Hon. R. S. Maestri, Mayor of New Orleans.

It's a far fling from gas ranges to airplanes but the resourcefulness of the manufacturers in meeting the demands of war will be equally valuable in meeting the challenge of peace.

Accounting SECTION

O. H. RITENOUR, *Chairman*
C. E. PACKMAN, *Vice-Chairman*
O. W. BREWER, *Secretary*

Better Job Relations Through Supervisory Training

By JOHN J. NATALE

Philadelphia Electric Co., Philadelphia, Pa.

PAPERS and discussions on training are not new to the Customer Activities Group Meetings because the value of educational programs to improve operating practices, customer relations and employee relations have been recognized for many years. Probably every company represented here today has been doing some training of one sort or another for years.

Most of the programs in the past have applied to the "how and why" of the job along with related general information as to company activities and policy. This type of training, when properly administered, had proved adequate and has paid dividends.

At our Spring Conference, H. J. Johnson of The Michigan Consolidated Gas Company brought this whole subject up to date in discussing "Wartime Personnel Problems." His paper presented many practical ideas and a sound philosophy that places our personnel problems in first place in importance. In his paper he challenged us by asking: "What are we doing to improve the art of supervision?" Mr. Johnson touched here a key point for there is general recognition today that supervision, particularly first line supervision, needs improvement, not only in supervisory job performance but to close the "gap" between first line supervision and the employees, and first line supervision and the management.

Qualifications of Supervisor

The three qualifications of supervision may be stated to be *knowledge, responsibility* and *understanding*. We have generally placed the requirements in that order when they might better be reversed, although it is rather difficult to say which is the most important.

In general, supervisors have been selected mainly for their knowledge of the job which they acquired over a period of years. Their ability to manage intelligently the men entrusted to them was left somewhat to chance or taken for granted. Our own company was no exception in this respect and we found some supervisors who were inclined to be arbitrary in making decisions; were not keeping in touch with their employees and were not "on their toes" in recognizing danger signs.

It goes without saying that a supervisor must have a thorough knowledge of the work to be performed; he must be honest, aggressive, have a pleasing personality, but above all he must understand human nature. It is this latter point that we shall consider in this discussion for we cannot take understanding of human nature for granted.

Several months ago in considering the shortage of available labor and the general attitude of our employees which was somewhat affected by the impact of the war—we came to the conclusion that there was a real need for training supervisors in how to handle employees and their problems.

Changed conditions brought into sharp focus some supervisory weaknesses and it was realized that teaching supervisors how to get along with people had incalculable possibilities. Some of the factors affecting the handling of supervisory problems were:

1. Lack of uniformity in dealing with employee problems.
2. Moving up of new people to supervisory positions.
3. New employees—changed routines—pressure of work.
4. Tension; feelings on edge; typical of today's conditions.
5. Jobs not so precious—couldn't depend on employees to adjust themselves to the job as readily as in the past.

These same factors, no doubt, have been responsible for the War Manpower Commission including supervisory training in their program of "Training Within Industry." Their program consists of three parts: "Job Relations Training," "Job Methods Training" and "Job Instructor Training." Most of this material is prepared for shop foremen and shop workers but can be readily adapted to clerical workers and office supervisors.

Following a review of the War Manpower Commission program, we requested the Director of Personnel Research and Training of our company to arrange for the preparation of a course for the commercial department supervisors.

The Customers Accounts Division supervision consists of 70 supervisors from 12 district and division offices and includes office managers, supervisors of accounting, collections and meter reading, centralized billing group and staff supervisors.

The material for the course was developed by conferences of the staff members with the Director of Training. Actual case situations were gathered from the various supervisors for inclusion in the course. These were to form the basis for discussion. No text book material as such, "paper work" or "grades" were included.

Training Program

Instructors to act as conference leaders were chosen from departments other than the Customers Accounts. They met with the Director of Training prior to each conference to discuss the subject material contained in that particular lesson. The choice of instructors outside of the department had many advantages, such as:

A—Not biased—as might be the case with supervisors within the department.
B—New to the group—brought other viewpoints into the discussion.
C—Ability to select persons who were experienced conference leaders.
D—A way to avoid policy discussions in class.

The supervisors were divided into five groups, each with a different conference leader. Men from different levels of supervision were included in each class. This, we believe, was an advantage as it permitted a wider exchange of experiences and gave those present a more general picture of personnel problems in the various levels of supervision.

The course consisted of five two-hour lessons covering a period of five weeks. In addition to the case problems previously mentioned we utilized films and records for creating discussion. Incidentally the films we used are produced by the Voca-Film Corporation. The scenes take place in factory settings but this does not detract from their value as a training aid for clerical supervisors as the material contained in them is thoroughly fundamental. The general objectives of the training program were:

1. To consider some of the problems which arise in dealing with people on the job.
2. To discuss supervisory practices in handling the human relations aspect of the job.
3. To consider what can be done by the supervisor to develop good employee

Presented at American Gas Association Annual Meeting in St. Louis, Mo., October 26-28, 1943

relations in his contact with his people on the job.

The purpose of the course was to discuss methods for increasing the skill of the supervisor in evaluating the human or personal side of each supervisory situation and in taking the best steps in handling them. This is not to be considered as a fully rounded out supervisory training program. There is more to supervisory responsibility than employee relations.

Job analysis, instruction of workers and cooperation with other supervisors and superiors involve techniques which supervisors can be taught to advantage. But just as certainly as employee relations come first in today's supervisory problems, so training for improved job relations comes first in the supervisory training program.

This course included consideration of what the supervisor can and should do to get to know his people; and what he can and should do in dealing with them so as to obtain maximum results in the way of good employee relations.

In these get-togethers the operating practices were discussed only insofar as they involved dealing with people.

Products of Experience

The supervisors were not required to work with any theoretical principles, but were to obtain experience in using some skills in dealing with people on the job. The methods have been tried and tested. They are the products of experience. They apply uniformly because people are people and on the whole turn out to be pretty much alike once you get to know them.

This statement does not mean that there are no differences among people. Each individual has some unique characteristics. Once this is realized you have the general rule: Treat people as individuals and not only as members of some group or class. Try to understand people in terms of their situations, backgrounds and experiences. This means that the more the supervisor knows about a person and the better he understands him, the more likely he is to evaluate the situations effectively.

The foregoing, I think, gives a general idea of the objectives and the general purpose of the course. As previously mentioned, five lessons or get-togethers were conducted. In three of these films were used and the following is a short description of the material covered.

The film entitled "Let's Talk Things Over" is in two parts. Part one shows some of the dangers of improper and insufficient contact with the employees. It indicates that supervisors can fail to develop a mutually satisfactory personal relationship with each and every employee entrusted to his leadership. Part two of the film indicates that it is not enough to merely contact the employee. The way he is contacted is of great importance in employee relations. It emphasizes four steps in a good contact, namely, Study the Men; Plan the Talk; Choose the Time and Place; Be Friendly.

These points may appear to be elementary, but as in teaching many other lessons it is necessary to use elementary principles as a starter. This is well illustrated by something I read a few days ago, taken from the Technical Manual of the Engineers Corps: "Chapter 3, Tools—Section 3, Driving:

1. To drive a nail
   - A—Hold the nail in place with the thumb and the first two fingers of one hand.
   - B—Grasp hammer handle.
   - C—Tap the head of the nail lightly to start it into the wood and remove guiding hand.
   - D—Drive the nail.

The second film dealt with the problem of handling employee grievances. The title, "A Stitch in Time" indicates that the major emphasis was given to their prevention. The film begins with the definition of a grievance, stressing the fact that it is the employee attitude rather than the supervisor's point of view that defines a grievance. The discussion period which followed the showing of this film also dealt with the definition of grievances, but in terms of practical situations that arise in our department's operations.

The third film, entitled "The Right Medicine" dealt with the supervisor's attitude and technique in handling reprimands. After showing the film the discussion centered on some of the most frequent reasons for reprimands in our own experience. The treatment of specific instances was discussed and agreement reached on the best procedure in such cases. As a result of this discussion each of the supervisors got the benefit of the experience and best ideas of the entire group.

The final film "It Takes Time" developed some suggestions for winning the confidence of employees and, of course, stressed the importance of maintaining personal contacts.

One meeting was devoted entirely to reviewing the material previously presented and applying it to case problems currently before the supervisors and sent in for round table discussion by the entire group. There is nothing like a current and unsettled case problem to stimulate thinking, to reveal differences in opinion, and to force a conclusion. The discussion of case problems was so interesting and, in the expressed opinion of many supervisors, so valuable that we have been urged by the group to continue supervisory meetings to be devoted entirely to the discussion of case situations.

This suggests that department heads might make constructive use of a supervisory conference in handling discussions and decisions on current policy and practice problems, rather than follow the usual method of issuing decisions and orders. It might even mean wiser, at least more "down to earth" decisions and it would go far toward meeting the criticism of employees and supervisors too, who say "The boss ought to take a training course like this."

At the close of the course, we developed a card to be given to each of those who participated. The information on this card is a complete outline of the points made in the course and may be well reviewed from time to time. The card is entitled "Principles of Good Job Relations" and continues as follows:

A SUPERVISOR'S JOB IS DEALING WITH PEOPLE

Get Acquainted and Keep Acquainted with Every Employee

Be friendly.
Greet each employee every day.

How to Gain Employees' Confidence

Treat each employee as an individual.
Talk to him about *his* interests, *his* work, *his* progress.
Look for unusual performance.
Give credit where it is deserved.
Tell him *in advance* of changes affecting him—and give the reasons.

Build Good Job Relations Through Planned Contacts

Learn all you can about the employee.
Plan your talk.
Choose the right time and place.
Listen.
Be sincerely concerned with what *he* thinks is important.
Act promptly—if there is anything that needs doing.

GAIN EMPLOYEES' CONFIDENCE BY DESERVING IT. ENCOURAGE THE EMPLOYEE TO COME TO YOU

When an Employee Has a Problem

Listen sympathetically—don't interrupt.
Don't jump at conclusions.

(Continued on page 524)

Nichols Joins Controllers

CALVIN A. NICHOLS, acting treasurer and controller of the American Meter Company, New York, has been elected to membership in the Controllers Institute of America, a technical and professional organization of controllers devoted to improvement of controllership procedure.

Who Will Sell What?

By FRANK C. SMITH

President, Houston Natural Gas Corp., Houston, Texas

Frank C. Smith

TODAY appliance manufacturers in the gas industry and every other industry are told what they can make. Utility companies and gas appliance dealers are told what they can sell. Customers are told what they can buy and, generally speaking, each of us is told what he can do or perhaps more to the point, what he cannot do.

Government control of every industry, every business, every home, every individual and every dollar provides the foundation upon which our country's program of all-out war has been built. Alarming and unacceptable as the aspects of this situation to the majority of us would be in time of peace, it is a condition which we must accept currently as the most direct road to victory.

When Merchandising Continues

But while it is our patriotic obligation to accept the war effort as it is being conducted and do our dead level best as individuals and companies in contributing to its effectiveness, we have an equally important obligation beginning right now; preparation for the day when victory is accomplished, peace is restored and Johnny comes marching home. The threat of excessive government control and the stifling of private enterprise will become very real Frankensteins at that time unless our pre-post-war thinking and actions have qualified us to cope with the situation. We of the gas industry must be ready to accept the challenge of employment for our returning service men, of keener competition than we have previously known, of new capital requirements, of new corporate tax renditions and assessments, of a vast and complex building program to meet housing deficiencies, of population shifts that may or may not work to our advantage, of inventory replacements and a hundred and one other contingencies.

Not the least of our problems will be the creation of a merchandising organization capable, among other things, of withstanding the flood of pent-up purchasing power which will be unleased upon our country to the tune of some thirty to fifty billion dollars, a sum several times as great as the total of all consumer durable goods purchased in 1941. Nor will the least of our problems be the assurance of having ready and available for sale to this money-burdened public consumer goods, through which our own product—gas—is sold, of such quality, style, efficiency and appeal that they will have their fair share of the market.

Thus, as we begin thinking in terms of sane and profitable merchandising for the future, one of the very first questions to arise will be that which is the subject for this talk: "Who Will Sell What?"

It would be inexcusable in a discussion of post-war markets to omit reference to Frank H. Adams' excellent paper on post-war planning, presented at our Cincinnati meeting last May, and to the first report of C. V. Sorenson's Subcommittee on Post-War Purchasing Power and Potential Markets, recently issued. These are both factual studies and the latter is also a statistical study. Both are of the highest order and, together with other studies and statements by others in the industry, are informing and illuminating to us who seek to learn what the future holds in this field.

It doesn't take a crystal gazer to predict that there will be a tremendous, unprecedented demand for new household appliances following the war. If there are dissenters to this opinion, I might refer them to the experience of the Southern California Gas Company last June. Many of you will recall that, when that company advertised sixty gas refrigerators for sale out of a small quota recently unfrozen, and announced that they would be sold on a "first-come-first-served" basis, several hundred men and women responded by standing in line all night, waiting for the sales office to open its doors the following morning.

This all-night vigil, which certainly must have been a revelation to salesmen who for years have been devoting every spare minute of their time toward thinking of ways to persuade the sales-resisting customer to buy gas appliances, may be interpreted as a preview of what is to come, particularly in the lush period which immediately will follow the war.

Thousands and tens of thousands of customers who have been forced to get by with worn-out appliances during the war are going to want them replaced during this lush period, and at once. It is a practical certainty that many of them are going to grab up the first appliances that are put on the market without too much consideration for quality. It should be remembered that, although there have been many scientific advances in home appliances under the impact of war, the public will not get the benefit of new, improved models for a year or two or three after the war, or perhaps longer.

Two-Year Period Critical

Many authorities warn us that the first two years after heavy fighting ceases, or the so-called lush period, will be a dangerous one, more dangerous to business even than the war years. Whether or not there is a dangerous boom or collapse will depend upon whether industry can increase its output of civilian goods as rapidly as individuals and enterprises will increase their expenditures for these goods. If the output of consumer goods is to meet the increased demand, the rate of increase must be far greater than it was in any year of recovery following 1933. Also it must exceed the pace set in 1919 and 1920 following the first world war. The National Association of Manufacturers predicts that during this period rationing will have to be continued; that, if all controls were relaxed at once, the rush of purchasers would use up the available supply in spite of a maximum increase in output.

A threatened, undesirable boom cannot be averted by traditional methods of credit control. A variety of methods, which for a short time will include rationing certain articles and for a longer time will include price controls may prove to be necessary.

If prices are held down reasonably well during the war and if a post-war boom or collapse is avoided, there will still remain, certainly for two years and perhaps for three years after the end of fighting, an unsatisfied, deferred demand for both consumer and capital goods, By this time technological change will have affected methods and materials. The fruits of industrial research will have included new products, improvements in products and

Address before American Gas Association Annual Meeting in St. Louis, Mo., October 26-28, 1943.

new uses for products. It is the period beginning at this time—the time when tools for making pre-war models have been dismantled and the new models make their appearance—a period which will be marked by bitter competition for aggressive selling, with which I propose to deal in answering the question: "Who Will Sell What?"

I prefer to reverse the order of the question and to discuss briefly, first, "what" will be sold.

Customer surveys show that Mrs. Henry P. Housewife has some definite ideas on the subject of household gas appliances and, mind you, Mrs. Housewife is that discriminating customer who has been willing to hang on to her old appliances for a few additional years in order that she might see for herself some of those magnificent mystical models about which she has heard so much but which have remained such closely guarded secrets while in the process of manufacture.

Carefree Appliances Wanted

Mrs. Housewife is going to want, and to expect, that her home, and her kitchen in particular, shall be made trouble-free—and, when she weighs critically the merits of the new gas appliances, that very thought is going to remain uppermost in her mind when she asks these questions:

Will the new gas ranges be compact and economize on space? Will they be easier to clean? Will there be new temperature controls? Will the pilot lights give off less heat? Will their surface be of a material that will not chip, crack or stain? Will perfect insulation have been attained? Will the ovens be larger? Will there be built-in features, such as a pressure cooker for canning?

And what about gas refrigerators? Will a quick-freezing compartment be included along with extra space to store frozen foods? Will the box be of changed design, featuring more accessible shelves? Will the amount of heat given off be reduced?

And is that water heater going to have a drain valve designed so that it will automatically and periodically flush the heater? Will water be safely maintained at 180 degrees without injury to the heater?

When it comes to the new gas house-heating units, Mrs. Housewife will be thinking in terms of year-round climate control, probably the push-button kind. She will be thinking of the control of hot weather and humid weather as well as the coal smoke and dust being excluded from her home and don't forget, either, that Mrs. Housewife will want her range, refrigerator, water heater and cabinets all to match —perhaps all in one piece. Her new equipment must be beautiful as well as efficient.

But who said that Mrs. Housewife is going to confine her post-war shopping to gas appliances? Whenever she has opened a national magazine within the last year or so she has been confronted with approximately eight times as much advertising, extolling the wonders of electricity and the virtues of electric appliances as has advocated the use of gas. She has tuned in on many a coast-to-coast electric sponsored radio program. She has read billboard announcements galore, displayed by the electric industry, and has received further information through direct-mail messages. She has been told about electronics—and you can bet that she is going to see for herself whether she can really put a roast in the oven, immediately thereafter sit down to dinner, and then find that the meat is ready to serve by the time she has finished with her soup.

She has been told all of these things straight through the war period and—we may as well be frank about it—only one radio program has mentioned the word "gas" to her and that a fine nutrition program by a refrigerator manufacturer, itself a well conceived, splendidly achieved program of public service and industry pointed toward Mrs. Housewife on Saturday morning but, after all, *one* program.

National Advertising Support

It is of great concern to me that, at a time when the gas industry is facing in post-war development one of the most momentous and difficult problems of its existence of more than a century and a quarter, the support for its national advertising program has waned. The inadequacy of the funds provided by the gas utility industry for national advertising, the failure of some to participate in the program and the willingness of others to surrender it and its acquired momentum because for the time being no appliances are available to sell—are these things due to shortsightedness or defeatism or the lack of confidence in the program itself? Don't tell me it's "combination-company indifference." I know better than that, and so do you. Perhaps we just did not have our sights set right.

Whoever said that a half-million dollars a year was enough of an advertising fund for a national advertising campaign which would do justice to and serve the purposes of the gas industry? Nobody said so; it just seemed to be about the best the gas utility industry could hope to do. As to that viewpoint, I think those who assumed it were optimistic, and regard it as one of the minor miracles of the age that the gas utility industry *put up that much*, even though it was "riding recovery" most of the time.

But from another viewpoint, perhaps we went about it the wrong way. Our sights might better have been set on the four million dollar fund needed to *match* the electric industry's annual national advertising expenditures, instead of on the arithmetical calculation that four cents times twelve and a half million equals half a million dollars.

Where did the money come from for the electrical manufacturers' advertising—that four million a year? From their profits, of course,—not from the utilities at so many cents per electric meter. The individual electrical appliance manufacturing companies set their sights on an adequate advertising appropriation; set a price on their product that would justify such an appropriation from their earnings, and proceeded to plaster North America with eight times as much advertising as could we with our "four-cents-a-meter" method.

What have been the results as to electric appliances sold? Satisfactory to them, certainly, or they wouldn't keep on following the method. Why shouldn't they like it? The customer is paying the advertising bill, as in every other case on earth except our "four-cents-a-meter" method. The electrical appliance customer gets a *better* and a *cheaper* product because the advertising he is paying for brings mass demand and, therefore, mass production that reduces the unit cost of appliances, and *also* provides huge funds for research that make his appliance a better one than the manufacturer's last previous model. And so the manufacturer and the electric industry have money for research as well as for advertising.

But never mind research, at the moment, though *some* gas utilities have *yet* to be convinced that they ought to spend from $100 to $5,000 a year on an industry-wide research program, believe it or not!

Just now I am talking about what Mrs. Henry P. Housewife is going to buy after the war, and I am telling you what you already know: that she is going to buy that for which a desire has been kindled within her; that which interests and attracts her most and which promises to serve her best and which she believes will deliver the performance it promises; not that for which a lesser desire has been kindled; not that which interests and attracts her less.

Must Build Gas Prestige

If the huge investment of the gas industry is to be protected and competitive inroads blocked, we must continue to promote public acceptance of gas through advertising. When we build prestige for the industry in the eyes of the public, we also give renewed encouragement to gas men and dealers in every community, large or small.

Every forward-looking industry today has its eye upon the post-war market. The gas industry, with its active and strongly financed competition, cannot afford to fall behind the procession. Post-war competition from electricity will certainly be more serious than anything encountered during the last decade. Nor can companies selling both gas and electricity view the situation without concern. With government ownership in the electric field a greater threat than in gas, the maintenance of the value of the gas investment through informative advertising assumes increasing importance.

I have lost patience with some of the pictures painted of the fantastic, futuristic world of tomorrow. In fact, I consider advertising and publicity ill-advised that carelessly pictures wild and weird dream-world products without factual foundation. I cannot believe that the average person will

take too much stock in such promotion.

On the other hand, intelligent, constructive advertising is going to influence greatly the consumer demand, which will in turn determine what we shall sell. It is this type of aggressive advertising that must reach those hundreds of thousands of brides whose husbands are at war and who have never gone to housekeeping. It must reach those families who intend to buy or start building a home within six months after peace comes; those 900,000 families, according to a figure arrived at by a recent survey of consumers by the United States Chamber of Commerce. And those are not going to be reached effectively through advertising furnished by any "four-cents-a-meter" fund. Mind you, I am all in favor of continuing that fund. *Some* gas utilities do not contribute to anything *but* that fund, so let's not take that single virtue from them. We will need it to equal or to top the advertising done by electrical appliance manufacturers in the fields where gas appliances serve Mrs. Henry P. Housewife best with the largest number of household units—units made and sold post-war, to the invoice cost of which is added by the manufacturer that tiny fraction of its cost, which fractions, earmarked for co-operative advertising and added together, will far outdo and out-perform the intra-industry competitive advertising of electrical appliance manufacturers.

Appliance Manufacturers Can Help

If you think that gas appliance manufacturers will not enter a cooperative program of gas appliance advertising, did you ever try showing them a workable program, and find out whether they would? I am well aware that in 1937 some nibbling was done at this subject when the idea was put forward that, of the two million gas ranges expected to be manufactured and sold that year, gas utilities would sell about 800,000; that utilities representing seventy per cent of these sales might be willing to go into a plan to contribute $1 for each range sold by them whereby a fund of $560,000 would be forthcoming for advertising purposes. Objection was made to this in view of the fact that the entire contribution would come from the utilities and so an alternate plan was offered whereby the gas utility making the sale and the appliance manufacturer who made the range would each pay fifty cents. That did not seem to work because many manufacturers of gas ranges sold none of them to utilities, which put the entire burden on those whose customers the utilities were, and so this plan fell by the wayside, though vigorous effort was put forth in its behalf and the A. G. A. E. M. was thoroughly cooperative. Then later on some consideration was given to the matter of participation by the range manufacturers contingent upon an increase in our "per-meter" contribution from four cents to six cents. However good these various plans have been, we are today at ebb tide of our eight-year program of national advertising. To get the fund back up to what it was in our best years is a tremendous task and some substantial elements of the gas utility industry, who for their own good reasons have not seen fit to participate in the past, may be expected to adopt the same position in the future.

And, if you think that gas appliance retail dealers—not merchandising utilities, but individual dealers—will not enter a cooperative program of gas appliance advertising, did you ever try to show *them* a workable program and find out whether they would? We have done it for years—that is, those years in which there were appliances to sell. Our cooperating dealers—every good dealer in every town and city we serve—have for years past joined in cooperative newspaper advertising, with each paying his proportionate part of the cost. We look upon it as a regular accepted practice and so do they.

If the manufacturer should agree and the retail dealer should agree to a workable plan, why should the distributor or the merchandising utility hang back? What we need, my friends, is to adopt the attitude, "How can we accomplish the needed advertising volume?", *not* the attitude "we cannot do more and better advertising than we have been doing." During the past few years we have had an opportunity to observe the result of the defeatist attitude in the affairs of other nations. Why should our industry not benefit by their experience?

I offer the National Advertising Committee the proposal, for what it is worth that it set its goal at the amount required and then proceed to plan to achieve it.

I have added this comment on national advertising to what I have had to say about what gas appliances will be sold post-war because I believe and repeat and re-emphasize what I believe to be a fact: that gas appliances which are worth wanting and which the public is informed about and is led to desire are the answer to the "what" will be sold if, indeed, the gas industry holds the answer.

Home Building Prospects

Many economists and business leaders feel that the only industry that can help us out of any possible post-war depression will be the home building industry. Some of this new home building will undoubtedly be in the form of pre-fabrication. The President of the Celotex Corporation foresees putting a completely equipped furnace in a house in six minutes; a kitchen with all appliances almost as quickly, the appliances having been constructed in a single pre-fabricated unit. In such instances *what* we will sell is going to depend upon our contacts and influence with builders and architects, and our ability above all to keep pace with the mass production methods, the standardization and the simplification that will characterize the housing field. *What* we will sell in terms of appliances will continue to be ranges, water heaters, refrigerators, house heating and air conditioning units. Each of these appliances will feature substantial improvements in the post-war decade, I am sure. Whether they will present the same form or approach their function through methods identical with those of the present or whether they will be affected by dazzling invention remains problematical.

What we will sell, by and large, will be determined by our ability as an industry to produce within reason the type of appliance our customers want or which we may properly lead them to want, with due consideration, of course, to the cost factor. The extent to which such appliances win the favor of the public will, to an appreciable degree, be determined by the ground work laid at this time.

Now that we have discussed *what* will be sold, let us refer again to the title of this paper and inquire *who* will do the selling. In the mad scramble for markets after the war it is equally as important in our case to know *who* will sell as *what* will be sold. In other words, the struggle will not be just a competition of products but much more a competition of distributing organizations and merchandising methods.

I doubt that there will ever be a better or more appropriate time than this for gas utility companies to wipe their slates clean and start from scratch with respect to their merchandising methods. Surely no better opportunity was ever offered individual organizations to review and analyze their past policies, plans and programs. It is hardly possible that they will discover no phase of their activity which would be better for being revised or supplemented or perhaps discarded altogether and replaced by another method.

Merchandising Policies

Information has been sought by a Post-War Planning Subcommittee of the American Gas Association as to the nature of the load-building and merchandising activities with which gas utilities will concern themselves following the war. In response to a questionnaire circulated by the Subcommittee, 164 companies had reported by September 30, 1943, of which 140 have practiced a merchandising policy of selling gas appliances to the public for their own account. Of these, 17 reported as being undecided concerning their post-war plans, one expects to drop its merchandising program entirely, 13 are planning other variations of their pre-war activities, one has a new plan—undisclosed—and 108 out of the 140 contemplate *no* change whatever. Of the 24 companies reporting who do not sell gas appliances to the public for their own account, four of these are planning to re-enter the merchandising field after the war, two are undecided as to whether they shall or not and eighteen expect to continue their non-merchandising policies. The number of companies reporting, totalling 164, is fully representative, as the reporting companies represent 82½ per cent of the total meters in the United States.

As to numbers, these figures reveal that

some people are doing some thinking, even if it appears to lead them in opposite directions. Any merchandising program and any merchandising policy that is not continually being tested and tried in the light of new and changing developments is not having a fair chance to do its best for the stockholder and security owner in whose interest it is to be used. While I do not think it likely that the experience of our company, serving a small and prosperous area along the Texas Gulf Coast, will lead us to throw overboard a program of dealer-cooperation which has been responsible for the sale of more than four and a half million dollars worth of gas appliances in less than nine years—with every sale made by a dealer, I would be delinquent in my duty to my company and unappreciative of my opportunities if we did not review our situation and determine in what respects our policies should be altered and our program modified and enlarged in view of changing conditions.

It is odd, not to say remarkable, that apparently satisfactory results can be attained by widely different—almost diametrically opposed—merchandising programs, but there was more than one key to Baldpate, more than one road to Rome, and it is not for one of us to say to another, "Thou shalt" or "Thou shalt not." I regard it as vastly more important that we shall examine our pre-war policies and programs and, whether we add to or subtract from them, that we work out plans which will do the utmost to stimulate appliance sales, that is to say, to obtain a wider distribution of efficient gas appliances.

Must Convince to Sell

None of us expect that some manufacturer will produce an appliance that will cause people to come along and take it away from us and from the appliance dealer. Always we and he are going to have to convince the public, including Mrs. Henry P. Housewife, of the superiority of gas over other fuels and the immense satisfaction to be attained with the use of gas appliances. This means convincing the management of the gas company from top to bottom; the gas company employees, the gas appliance dealers and their employees and, equally important, our customers. And it will not be sufficient for us to attempt to *equal* the sales achievements of pre-war years.

If we adopt a program of holding our own, we will find that we have no market to hold. The defensive position is no better than the defeatist attitude. If our service is best for the prospective customer, then we should have his business. There are two million electric refrigerators which have worn out, shaken themselves to pieces and practically deafened their owners during these years of enforced scarcity. In these two million refrigerators is an annual revenue of twenty-five million dollars, if each should be replaced by a gas refrigerator. If we leave the defensive and take the offensive, this can be accomplished. If not, it certainly will *not* be accomplished.

It is apparent that the answer to the problem of "Who Will Sell What?" will be of immense interest and value to the manufacturer in planning for post-war. If he is able to count on the gas utility to assume some responsibilities in the direction of gas appliance merchandising, his problem is considerably simplified and he may move forward more aggressively and confidently. If some sort of unanimity could be reached among gas utilities as to their dealer relations and confidence established in the oft-asserted desire to cooperate, a good deal of price chiselling, excess trade-in allowances and other undesirable selling practices could be avoided.

Regardless of the benefits of "dealer-coordinating" plans which involve competitive selling by the utility itself—whatever those benefits may be—every merchandising utility, just as every non-merchandising utility ought to see to it that every facility it can lend to the dealer is lent; that his agency for approved appliances is put before and kept before the public; that equitable service arrangements are provided; and that his installment sales terms are as attractive and advantageous as the utility's own (for installment selling is not gone forever). For, if these things are not accomplished in one way or another that dealer will

(Continued on page 524)

N. Y.-N. J. Gas Sales Managers Discuss Post-War Problems

NEARLY fifty sales managers and sales executives of gas companies in the New York-New Jersey area gathered at the Hotel Pennsylvania on Friday, November 19, to attend the second New York-New Jersey Sales Managers Round Table Discussion held during the current year.

It was the purpose of this meeting to discuss and analyze the many problems which the industry must face in the post-war era. The morning session featured a series of lively discussions led by individual gas company executives relative to steps taken to ascertain consumers' preference regarding post-war gas appliances and servicing.

In addition, R. J. Canniff, advertising and sales promotion manager, Servel, Inc., reviewed the progress made by Servel in the All-Gas Package Kitchen Program and Howard Myers, publisher, "Architectural Forum," discussed the future of new housing and the new home market in the post-war period.

Alexander M. Beebee, chairman of the Association's Post-War Planning Committee, delivered an inspiring luncheon address giving the background and accomplishments of his committee.

Major Forward congratulated those in attendance and stressed the importance of such meetings as a means of preparing the industry for post-war operation stating "that it would be up to the sales personnel of the industry to meet post-war competitive conditions."

The afternoon session featured a panel discussion on post-war problems in which J. P. Leinroth, Public Service Electric & Gas Company, H. Leigh Whitelaw, managing director, Association of Gas Appliance and Equipment Manufacturers, and Arthur P. Hirose, director of market research & promotion, McCall Corporation, New York City, participated. This panel discussed a series of questions regarding the industry's post-war activities especially selected from those submitted by gas companies in the area.

The meeting was also attended by gas appliance manufacturers representing the main appliance divisions of the A.G.A.E.M. J. R. Lavelle, sales manager, John Wood Manufacturing Company, represented the water heating division and Frank J. Hoenigmann, executive vice-president, Cribben and Sexton Company, represented the range division.

The program was under the direction of R. E. Williams, new business manager, Binghamton Gas Works, Binghamton, New York, chairman of the New York-New England Gas Sales Council of the Residential Section. As an indication of the meetings' success and productiveness, it was tentatively planned to increase the meeting to a two-day session the next time it is held.

Plan Accelerated CP Promotion

PLANS for increased promotion of Certified Performance gas ranges in 1944 to assist dealers and gas utilities build post-war business were announced by Lloyd C. Ginn, chairman of the Sales Management Committee of the Association of Gas Appliance and Equipment Manufacturers at the A. G. A. Annual Meeting in St. Louis. The 1944 program will include trade paper promotion, a nation-wide newspaper campaign, direct mail and point of sale material aimed to assist dealers and gas utilities obtain advance orders for post war deliveries.

Results of the 1943 program were gratifying, Mr. Ginn reported. Mats supplied to dealers and gas utilities appeared in more than 889 newspapers in thirty-eight states with an estimated total circulation of twenty million.

Specifications for post-war CP gas ranges were discussed by the CP manufacturers in St. Louis.

HAVE YOU SEEN IT? . . . .

By C. GEORGE SEGELER

Apparently the idea of summarizing and commenting on new material which should be of interest to industrial gas departments is approved, that is, judging from comments received anent this new column labeled "Have You Seen It?"* Not that it can be promised for every issue because new material of special interest to the industrial gas engineers does not always appear at convenient dates. But, keep your eyes peeled for this column. We'll promise to pick out interesting items for you.

SAFETY is a vital factor in our war effort. An explosion in a gas furnace may involve personal injury or may disable production. In either case, it should be avoided. Since industrial gas furnaces potentially, at least, may represent hazard, this would seem to be an ideal time to check up on safety controls to see that full and proper protection is given to every industrial gas unit. It will not be hard to make the plant management see the point that money spent for safety equipment is a wise investment not only for the critical needs of war production but for safety of their post-war, peace-time work as well. Moreover, funds may now be more readily available than at some future time when industrial business is not as prosperous as now. Valuable new information on "Industrial Combustion Hazards"† and on "Combustion Safeguards in the Utilization of Gaseous Fuels",‡ both from the pen of T. A. Cohen, chief engineer of the Wheelco Instrument Company, is worth careful attention.

While on the subject of instrumentation, it might be well to draw attention to the comprehensive discussion of "Gas Pressure Regulation for Industrial Gas Service" by C. C. Abbott of the Pittsburgh Equitable Meter Company, which was the lead article in the May, 1943 issue of *American Gas Journal*.

Apropos of the conservation program for the coming winter, the Equitable Gas Company of Pittsburgh has emphasized improvement in the efficiency of furnaces by means of checking excess air. Steps to reduce air leakage seem particularly appropriate wherever large-scale operations are being carried out which, because of their very size, offer substantial opportunity for gas saving. Infiltration of air through loose brick construction, peep holes, and loose fitting doors should be stopped by appropriate steps. Induced excess air injected around open burner ports is another easily over-looked source of over-ventilation.

While these steps are self-evident and are perfectly well-known to every gas engineer, the rush of war work makes it easy to skip over detailed work of this kind. It is stimulating, therefore, to read an article like "Excess Air, The Enemy of Efficient Furnace Operation" by D. W. Frye which appeared in the May, 1943 *Industrial Gas* and which supplements a previous article along similar lines under the title "Conservation Through Industrial Furnace Design" which was in the same journal in February.

In 1931, the Chrysler plant at New Castle, Indiana, installed the first continuous gas carburizing furnace thus opening a new field of gas application which has all but revolutionized carburizing, making it possible to carburize to a uniform depth practically any shape of steel part. There were, of course, earlier methods of gas carburizing which laid the ground work for the modern developments. However, after many years of experience with this type of carburizing, certain handicaps have been revealed which must be overcome in successfully applying continuous gas carburizing. For example, certain of the early cast alloy trays used to carry the work actually burst due to the deposition of carbon in the shrinkage areas within the castings.

There was also an early problem in maintaining the muffles so that they would remain gas tight. Other problems included carbon deposits on the work which may not have interfered with the carburizing process but which certainly was objectionable to the point of dirtying the work and, for that matter, there were certain forms of carbon which actually did block out further carburizing.

Step by step, each of these and other difficulties were revealed and countered. Re-reading this story in detail, as outlined by R. J. Cowan, beginning in the September, 1943 issue of *Steel* under the title of "Developments in Continuous Gas Carburizing" brings you up-to-date on this important industrial gas application. It furnishes ammunition that may be needed to explain how modern industrial gas equipment will do the job right if a customer has in mind one of these earlier difficulties and does not yet know how it has been licked.

It seems almost unnecessary to mention the series of articles on the basic principles of combustion engineering of hot dip galvanizing furnaces which has been running serially in *Industrial Gas* since April, 1943, because these outstanding discussions have certainly been carefully clipped and filed by every Industrial Gas Department so as to be on hand for future reference. The relation of combustion equipment and its lay-out to the important elements of cost of galvanizing, such as pot life, uniformity and quality of coating, heat losses, and pot design are each discussed in separate sections. The author, W. G. Imhof, technical director of Research for the American Hot Dip Galvanizing Association and widely known in the galvanizing field, gives concrete and specific reasons for his recommendations. Without doubt, they should be of considerable aid and comfort to all producers of galvanized products.

Magnesium and Aluminum Alloys

Among the newer metals featuring prominently in current production problems are magnesium alloys and aluminum alloys. By the time this gets into print, the 1943 report of the American Gas Association Committee on Use of Gas in the Heat Treatment of Aluminum and Magnesium Alloys will be available. There will also be new papers on these subjects presented before the American Society for Metals' Meeting being held in late October in Chicago. In addition, *The Iron Age* for September 2, 1943; *American Gas Journal* for July, 1943, and *Industrial Heating* for September, 1943, all carry new and important papers dealing with the various phases of aluminum and magnesium foundry problems.

The gas industry has a big stake in these metals because of the large amount of gas required for heat treating them and because, for a time, there was a real competitive fight to see whether gas would be the top fuel in this field of heat treating and melting. The special problems of aluminum and magnesium include accur-

* The first column appeared on page 324, July-August issue.
† National Safety News, January, 1943, starting with page 24.
‡ Gas, March, 1943, page 23.

rate control of temperature, to a degree not quite so necessary for other metals.

In addition to the papers that have been mentioned above, the American Gas Association's committee is fortunate in being able to draw on its extensive collective experience in this field which would certainly be of direct assistance to any gas company faced with competitive problems or whose customers were having fabrication difficulties traceable to the melting or heat treatment.

For the present, the use of gas for industrial and commercial space heating and comfort cooling is more or less out of the question on account of the gas Limitation Orders except in a few favored localities. However, this is a market for industrial gas which will undoubtedly be fully exploited in a post-war era, and this is a good time in which to accumulate a file of constructive material that will assist in the technical and sales phases of this gas application. H. O. Loebell has presented some provocative ideas in his paper before the Industrial and Commercial Gas War Conference held in Detroit in March, 1943. Copies are available from the American Gas Association, and it was reported in the Post-War Planning Section of *Gas Age,* April 22, 1943. The importance of this paper lies in the calculations that are presented for the purpose of establishing the proper load factor. It has been asserted by some that the load factor for industrial and commercial space heating was decidedly worse than load factors for residence heating. Mr. Loebell's computations lead to the reverse conclusion, namely, that the load factor for this business is within the range of the domestic house heating load factor for the same area. He presents facts and figures to back up his point and, by so doing, changes the whole approach to the industrial and commercial heating load.

In any event, some big industrial heating installations have been projected and carried through while the gas industry was debating. The Olean Hospital, New York, described in Domestic Engineering, November, 1942, The Beachwold and the Boulevard Theatres in Columbus, Ohio, described in *Industrial Gas,* February, 1942, the Naval Ordnance Plant in West Virginia, where floor type, direct air heaters were used, described in *Industrial Gas,* May, 1942, are representative of a few of the last important jobs to be installed before the Limitation Orders cracked down on extensions of gas service.

Most revolutionary of the development trends in the gas heating field is the subject of infra-red heating with gas. There has been considerable publicity on this subject both in English and American journals. The English material, in particular, is very instructive and should be read by all those who have access to the *Gas Journal* (published in London) for July 28, August 4, and August 18, 1943. This paper "Radiant Heating for Industrial Processes. Infra Red By Gas" written by L. W. Andrew and E. A. C. Chamberlain as a report to the Institute of Fuel, England, is the most comprehensive paper on this subject which has thus far appeared.

Industrial and Commercial Gas Advertising for December

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full page advertisements will appear in the trade and business magazines listed below during the month of December. These advertisements are prepared in cooperation with the Committee on National Advertising as a part of the industry's national advertising campaign.

MAGAZINE	THEME
	General Manufacturing
BUSINESS WEEK (Dec. 11—⅔ page)	"Streamlined heat-treating . . . one of today's *GAS* contributions to industry."
	Metals Industry
THE IRON AGE (Dec. 16) STEEL (Dec. 20) METAL PROGRESS METALS & ALLOYS INDUSTRIAL HEATING	"Streamlined heat-treating . . . one of today's *GAS* contributions to industry."
	Ceramic Industry
CERAMIC INDUSTRY	"New ceramic markets on the horizon? *GAS* plays important role in ceramics . . ."
	Glass Industry
GLASS INDUSTRY	"Doing new things with Glass . . . for war and peace! *GAS*-fired equipment helps."
	Baking Field
BAKERS WEEKLY	"Having manpower troubles? Properly maintained *GAS* equipment can be a priceless asset."
	Hotel and Restaurant Fields
RESTAURANT MANAGEMENT HOTEL MANAGEMENT	"The military's experience with modern *GAS* equipment."
	Hospital Field
MODERN HOSPITAL	"Why military foods get better . . . Trained dietitians and up-to-date *GAS equipment* make a strong team."

"I venture to say that industrial gas fuel, as such, merits the Army and Navy 'E' Award for service faithfully and continuously rendered in the war production effort."—Albert A. Schuetz, Milwaukee Gas Light Co.

Post-War Deep Fat Fryers

J. C. PITMAN & SONS Inc., Lynn, Mass., has recently sent an inquiry to thousands of users of the Pitco Gas Frialator in order to get their candid opinion of these deep fat fryers, based on actual use, and to get users' views on improvements for after the war models.

Eighteen prime questions are asked, and these are supplemented by eight questions directed at further facilitating and improving the servicing of these hotel and restaurant gas appliances. Interesting replies are pouring in, James F. Pitman president of the company, reports.

Gas Cooking Exhibit

An educational exhibit of Blodgett gas ovens, showing how commercial kitchens can be redesigned and rebuilt thereby greatly increasing capacity. An interesting booklet entitled "Case Histories of Successful Mass Feeding Operations" which gives twelve practical layouts for designing mass feeding installations was distributed in connection with this exhibit.

The display at the Pittsburgh convention of American Dietetics Association was in charge of Daniel J. Brogan, sales manager of the G. S. Blodgett Co., Inc.

Technical SECTION

CHARLES F TURNER, *Chairman*
L E KNOWLTON, *Vice-Chairman*
A GORDON KING, *Secretary*

Tin Conservation in the Repair of Gas Meters*

By J. H. COLLINS†

Chairman, Subcommittee on Meters and Metering

J. H. Collins

IN the recent pre-war years, the largest single item of tin consumption in the United States had been in the manufacture of tin plates. The consumption of tin in solder represented the second largest use. In 1940, a pre-war year, this use of tin amounted to 19,019 long tons, and in 1941 it was increased to 28,225 long tons. Today, because of the conservation of tin by the gas and other industries, the consumption of tin has materially decreased and the tin content is derived largely from secondary metals.

Conservation Orders

The government began the conservation of tin by issuing Conservation Order M-43 in December, 1941, which restricted the use of tin to 50% of the amount used in the corresponding quarter of 1940. At a later date the amended Conservation Order M-43-A restricted the use of tin still further to an amount of not more than 40% of the amount of tin used in the corresponding quarter of 1940. The order also restricted the use of tin solder to 38% by weight prior to May 1, 1942, and the use of tin in solder to 30% by weight on and after May, 1942.

When the Conservation Order restricting the use of tin to 30% by weight after May 1, 1942 was issued, gas companies and meter manufacturers immediately began experimenting with such solders. The general opinion of the utilities being that such a solder of 30% tin content would not prove to be a suitable substitute for the 50-50 solder normally used on repaired meters considering the obligation of the utilities to their customers from a factor of safety point of view, and because of meter repair difficulties.

Many of the companies and manufacturers had performed considerable experimental work during the period prior to the 1942 A. G. A. Convention, with the use of solder of various tin contents and without the use of tin in the solder. Except for perhaps one or two of the larger companies, who had perhaps developed special technique, and adapted soldering equipment to the use of this 30% content tin solder, practically all of the other companies, large and small, were far from satisfied with the results obtained either in the strength of seams, or in the net saving of tin by the use of such solder.

Consequently, following representations of the American Gas Association and others, the War Production Board issued Preference Order M-43 as amended January 9, 1943. This Amendment Order was as follows:

"(b) *Restriction on Use of Tin in Certain Tin Case Gas Meters.* Notwithstanding the provisions of any state statute or governmental regulation, no person shall use tin bearing material in the adjustment, internal repair, or resealing of any tin case gas meter having a rated capacity of less than 300 cu.ft. per hour except:

(1) A meter which is found not to be accurate, within plus or minus 4% when tested by standard meter prover tests; or

(2) A meter which has not been previously repaired for twelve years or more.

The restrictions of this paragraph (b) shall not apply to any such tin case gas meter which was withdrawn prior to the effective date of this order for the purpose of testing and returning it to service."

This order as written had the following weaknesses:

a.) Returning meters to field service which were not within the tolerated range of accepted practice.

b.) A meter which had not been periodically repaired within the past 12 years, and because of local conditions should be rediaphragmed or diaphragm re-oiled in a much shorter period.

c.) A meter having a defect other than listed in exceptions.

If defective meters not covered by the exceptions listed above could not be returned to service new meters must of necessity replace them. This would result in a greater use of tin bearing material.

In some instances the postponement of Periodic Shop Changes over too long a period may have lowered the standard of good service, or perhaps caused an accumulation of periodic maintenance, which may have required several years to level off.

At a meeting of the Technical Section in December 1942, the opinion was expressed that by an improvement in the technique of soldering and the careful recovery of salvaged solder, enough solder might be recovered to permit the repairing of a meter without the necessity of purchasing additional tin for solder.

Meter Soldering Experiments

Experiments were conducted by companies represented by the Meter Committee and others independently conducting such tests, with excellent results, definitely indicating that enough solder could be recovered to permit practically all repairs to all types of meters. In shops where the solder technique could not be improved so as to recover enough solder of the approximately 50-50 composition, the recovered solder could be reduced to approximately 40% tin and 60% lead, and the repairs be self sustaining.

Several of the large gas companies requested permission to be allowed to perform all types of meter repair work, using only tin in reclaimed solder. After these intercessions and that of the Association the WPB finally agreed to these revisions, and on April 26, 1943, issued the Revised Conservation Order M-43-b, which states:

"Section 1001.3—Supplementary Order M-43-b, is hereby amended to read as follows:

(a) *Definition.* For the purpose of this order:
'Person' means any individual, partnership, association, business trust, corporation, governmental corporation or agency, or any organized group of persons, whether incorporated or not.

(b) *Restriction on Use of Tin in Certain Gas Meters.* After February 15, 1943, no person shall use tin-bearing solder or other tin-bearing material in the adjustment, repair, or resealing of any tin-cased gas meter having a rated capacity of less than 300 cu.ft. per hour except:

(1) A meter which is found not to be accurate within an accuracy range of plus or minus 4% when tested by standard meter prover tests:

(2) A meter which has not been previously repaired for twelve years or more:

(3) A meter which has developed an opening through which gas es-

* Abstract of report presented at the American Gas Association Annual Meeting in St. Louis, Mo., October 26-28, 1943. The complete report of the Subcommittee on Meters and Metering is in printed form and is available from the Association.

† Superintendent of Gas Distribution, New Orleans Public Service Inc., New Orleans, La.

capes in the outside case or connections: or

(4) A meter which has a functional defect other than mere failure to register accurately within the range specified in subparagraph (b)(1) above.

The restrictions of this paragraph (b) shall not apply to any such gas meter which was withdrawn prior to January 26, 1943, for the purpose of testing and returning it to service. Furthermore, nothing contained in this paragraph (b) shall prevent the repair or resealing of any tin-cased gas meter if the only tin-bearing solder or other tin-bearing material used for such purpose is derived from material reclaimed from meters brought in for repair."

Operation under Revised Order

The Subcommittee on Meters and Metering deemed it advisable, now that the Order had been in effect approximately six months, to seek a fairly representative opinion as to its success by contacting a number of companies geographically located throughout the United States.

Following is a summary of the meter repairing experiences of the companies contacted:

Ninety per cent of the companies contacted stated that they were able to conduct a full meter repair program under the Order M-43-b, using only the tin in solder recovered from repaired and condemned meters.

Ten per cent had postponed the changing of meters for periodic shop repairs other than meters not having been repaired in 12 years or more.

Of the companies performing a practically full schedule of meter repairs using reclaimed tin in the solder exclusively, 60% use the solder recovered as is after refining, 40% reduce the tin content to between 38 and 42% by addition of lead.

As mentioned in a previous statement, many of the companies by a careful study of their soldering technique have been able to reduce safely the quantity of solder used in resoldering the meter, materially aiding the self-sufficiency of the solder requirement in their shops.

Briefly summarizing the effect of the revised M-43-b Order, after 6 months operation it may be stated that the order has been generally satisfactory to the gas industry, permitting the industry to carry on the necessary meter repair schedules without the use of additional tin, and to the government in that a greater amount of tin has been conserved than would have been possible under previous proposed restrictions.

Use of Low Tin Content Solder

Many of the gas companies and the meter manufacturers have performed and are performing considerable experimental work in the use of low tin content solders. Much of this information has been made available to me for this discussion. Should anyone be further interested, this information will be made available to them.

The problems of the meter manufacturer are very ably outlined in a discussion of the experiments in the use of low tin content solders conducted by the American Meter Company. This report while particularly referring to new meter construction, gives us an insight into the phenomena controlling the use of solders of various compositions and the part each component plays.*

It is evident that the meter manufacturers are convinced as a result of exhaustive tests that solder of tin content lower than 38% cannot be practically used at this time in the construction of new meters.

Experience with Low Content Solder

The use of solders of low tin content in the repairing of gas meters is discussed in the following summary of experiences of gas companies representing a cross section of our country, who have been performing considerable experimental work with such solders. These opinions are as follows:

Company "A"

1. Net saving in tin is not possible due to increase in quantity of solder necessary. The amount of tin used remained the same with 5 ounces of tin being used. The increase in solder using 30% tin over 50% tin was from 10 to 16 ounces with 5 ounces of tin used with either solder.
2. Higher temperature necessary when using these lower tin content solders. This is a very important factor to be considered when soldering leather diaphragms. It is almost impossible to install leather diaphragms with these solders without scorching the leather or melting nearby seams installed with 50-50 solder.
3. 38-62 and 40-60 solders have and are being used with fair success, being careful when soldering diaphragm ring to partitions.
4. Results using the 30% tin and various percentages of antimony from 1 to 5% gave inconsistent results, particularly those using 1 and 5% antimony. Some of the seams would hold, others would crack open. The solder containing 2% antimony gave the most consistent results. We are not, however, satisfied with results obtained with even this solder. The results are not consistent and are too unpredictable.

Company "B"

It is our opinion that the use of low tin content solders will result in decreased strength of soldered seams and thereby more danger of gas leaks on customer's premises will increase labor costs at the present time, and will increase maintenance costs in future years. We feel the use of these solders will result in more meter failures, such as flag arms and wrist pins breaking loose, besides seam leaks. As the gas meter is really the cash register of any gas company, we feel they should be installed on the customers premises in as perfect condition as is humanly possible and remain in that condition for the time they remain in service before being brought in to the shop for periodic inspection, whatever the period may be. It is our opinion that this is not consistently possible with any solder that contains less than 50% tin, and we therefore strongly recommend the return to 50-50 solder as soon after the war as possible.

Company "C"

1. We are convinced by experiments that labor costs would increase using low tin content solder.
2. The labor costs would definitely be excessive using solder containing no tin content.

Company "D"

1. When using solders of a tin content less than 45%, labor costs increased materially.
2. Experiments have shown that the tin saving from the lower tin content solder was negligible because of heavier seams being necessary. This condition was more prevalent in our smaller shops where soldering technique was not as developed.

Company "E"

1. Extremely doubtful of strength of seams or safety of the soldered seam in service.
2. Are using satisfactorily a composition of 38% tin, 1.5% antimony and 60.5% lead. 2% antimony would be more satisfactory, however we find that raising the antimony content to 2% has a noticeable effect in detinning the irons.
3. Repair personnel would have difficulty in mastering the 30% solder.

Company "F"

1. Solders of tin content lower than 38 to 40% had a tendency to be porus and in many instances the seams cracked. The 38% solder withstood a low temperature test of 10° F., and a four second intermittent 1 lb. per sq.in. pressure test.
2. Labor costs increased for a period of several months using 38% tin solder, but are now back to that of 50-50 material.

Company "G"

1. 5000 meters on test in field with 30% tin—68% lead and 2% antimony solder for one year. Not one returned to shop for leakage or failure of any kind.
2. Used same amount of tin when compared to total quantity used.
3. Labor factors increased 3% over 50-50.
4. No trouble experienced with teaching personnel use of 30% tin.

* Important parts of the American Meter Company's report are reproduced in the printed report of the Subcommittee on Meters and Metering.

Company "H"

Special technique required when using the 30% tin content solder—(30% tin, 2% antimony, 68% lead).

The successful use of the low tin content solder requires several conditions not present in the use of standard meter solder. First, the higher percentage of lead requires a higher heat in the soldering process and as this heat is given up more rapidly, a larger unit of copper is required. Secondly, the "nose" of the copper being the point of heat contact, it is necessary to create a rounded "bull nose" in order to draw the heat to the work. Number 5 coppers (2½ lb. each) are used in tandem for alternate heating. The important technique is to first "sweat" the seams and on the second application draw a bead. There are numerous other details which require attention, particularly in the prevention of the applied heat extending to other soldered parts, as for instance, in the installation of new diaphragms, and the outer seam of the back plates.

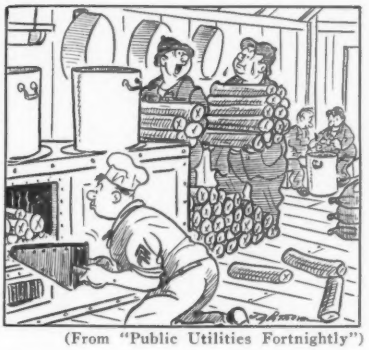
Fortunately, during the past winter some of our shop personnel have had some experience with low tin solder, so that with the advent of the present development, the change is less radical than normally would be expected.

We believe the following conclusions are justified by the results obtained by outside agencies and confirmed in part by our own tests:

1. The solder formula proposed has proven technically to be practically equal to the 50-50 solder previously used, provided it is thoroughly mixed and a uniform product obtained.
2. It is evident from experience that the successful use of the low tin content solder depends to a large extent on the skill and workmanship of application, supported by adequate inspection.
3. From the results obtained in our preliminary work, supported by severe tests by other agencies, we believe that the solder composed of 68% lead, 30% tin and 2% antimony, can be successfully used to repair our gas meters.

Company "I"

1. 30 Meters completely repaired including diaphragm with solder of composition 30% tin, 2% antimony, 68% lead, have been in service 12 months exposed to the atmospheric elements. These meters have been examined at intervals and have not up to the present time exhibited any flaws internally or externally.
2. Approximately 10% more solder used than when using 50-50, but believe that with improved technique quantity can be reduced somewhat. Would however be compelled to use approximately 10% more solder of 30% tin content as a factor of safety.
3. Approximately 10% increase in labor required. This would also be reduced with practice to approximately 5%.
4. Close inspection and control of soldering technique would be necessary to reduce the possibility of meter leaks.



(From "Public Utilities Fortnightly")

"Now I am beginning to understand the slogan, 'Gas Cooking Is Superior'"

General Conclusions

Attempting to draw a conclusion from the experiences of gas companies in the use of solder of lower tin content than 50-50 in the repairing of gas meters, it may be stated that a solder of the composition 38% tin, 2% antimony and 60% lead; or 40% tin and 60% lead can be and is effectively used.

A solder of a composition such as 30% tin, 2% antimony and 60% lead may also be used comparatively successfully by the larger repair shops where close inspection, more highly trained personnel, better developed soldering technique, and the development of suitable soldering equipment is available. However the use of solder of a tin content of less than 38% in the soldering of gas meters in the average meter shop throughout the country would not have saved a net quantity of tin, would be a burden on the curtailed labor situation because of increased time of repairing and because of lack of knowledge and the necessity of closer control in the use of this low tin content solder, would be a hazard to life and property because of the possibility of leaking gas on consumers premises.

The use of solder reclaimed from the repairing of meters and from condemned meters has proven to be sufficient to permit the industry to carry on the necessary repair schedules and maintain their high standard of meter performance without the necessity of using new tin.

In closing, it may be of interest to note that the United States only smelting plant is located in Texas. This plant began operations in April, 1942, and will have a possible production of 30,000 tons in 1943. This capacity will eventually be increased to 95,000 tons.

Actual use of new tin was cut 65,000 tons in 1942. The Bolivian ore now being processed is obtained by vein mining. The concentrate contains from 18 to 70% tin compared to an assay of 74% tin in the concentrate from the Japanese held alluvial deposits.

Committee on Industrial Aromatic Hydrocarbons

AT an organization meeting of the new A.S.T.M. Committee D-16 on Industrial Aromatic Hydrocarbons held in New York on October 26, the personnel of the group was approved and temporary officers were selected. The committee is concerned with the development of standard methods of tests, definitions and specifications for these materials and related products which boil below 400° F. Products covered would include various grades of benzene, toluene, xylene, solvent naphthas and other light oil products.

Temporary chairman of the committee is J. M. Weiss, consulting chemical engineer, New York City. R. P. Anderson, secretary, Division of Refining, American Petroleum Institute is temporary secretary, and C. A. Lunn, process engineer, Consolidated Edison Co. of New York, Inc., is vice-chairman. These officers will serve until June, 1944, when the committee will select permanent officers.

Detailed work involving research, actual drafting of the standards, etc., will be carried out through subcommittees. The following subcommittees are being organized with officers as indicated.

I Methods of Test of Crude Aromatic Products—C. A. Lunn, Chairman; D. F. Gould, Vice-Chairman

II Methods of Test of Refined Aromatic Products—V. J. Altieri, Chairman; E. T. Scafe, Vice-Chairman

III Specifications for Aromatic Chemicals —J. N. Wickert, Chairman; Wesley Minnis, Vice-Chairman

IV Specifications for Aromatic Solvents—R. E. Ruthruff, Chairman; L. A. Wetlaufer, Vice-Chairman

V. J. Altieri, Eastern Gas & Fuel Associates, Everett, Mass., is chairman of the American Gas Association Technical Section Chemical Committee. Last summer Mr. Altieri's work on Light Oil and Light Oil Products—a part of the Gas Chemist's Handbook—was published by the American Gas Association.

WPB Relaxes Tin Solder Restriction

THE War Production Board on November 3 issued General Preference Order M-43, as amended, relaxing restrictions on the tin content of solders where it has been found that higher tin content is necessary.

Previously this higher content could be used only upon the granting of appeal. But under the amended order specific provisions permit higher tin content, in some cases above 21 per cent, for certain solders, thus reducing paper work. Careful survey has shown that the higher tin content solders permitted will actually result in a saving of tin.

The amended order also permits the reworking of block tin pipe.

(Continued from page 506)

in Table IV were obtained using a 500 ml. sample for analysis. Blanks were run on the air used to make the dilutions and no carbon monoxide was indicated. It is of interest to note that a blue starch end point could be observed even when the concentration of carbon monoxide in the mixture had been reduced to .0002 per cent, or 2 parts per million by volume, but that no color was noted when concentrations of carbon monoxide below this limit were used. These color changes in such dilute mixtures could only be observed by comparison with a second tube prepared in exactly the same manner as the first but without having had the sample passed through it. This represents the extreme limit of carbon monoxide detection when a 500 ml. sample is used.

In some preliminary work using larger samples (2000 ml.), it was found that the lower limit of carbon monoxide detection was 0.2 parts per million. Further work will be required to establish this limit more definitely. The question of using samples larger than 2000 ml. has been raised, but the answer requires further work. In general, it appears that as the size of sample increases the period for running the test increases and the lower limit of carbon monoxide detection decreases.

In the analysis of synthetic mixtures containing carbon monoxide from manufactured gas and from a flue gas formed by the partial combustion of the manufactured gas, no difficulty was encountered, and the results (see Table IV) indicated that the purifying system was satisfactory.

The results of a considerable number of tests show that in general with the instrument in good working condition and when the carbon monoxide concentration is 100 parts per million or less, one fifteen-minute run will remove all the carbon monoxide present. When the carbon monoxide ranges between 100 to 400 parts per million, one fifteen-minute run will remove some 90 per cent of the carbon monoxide present and a second run will remove the remainder. When the carbon monoxide concentration ranges between 400 to 2500 parts per million, one run will remove around 90 per cent of the carbon monoxide present, a second run will remove around 80 per cent of the remaining carbon monoxide, and a third run will remove what remains. In the above tests the 500 ml. container was used. For samples containing 1000 or more parts per million, the smaller 250 and 150 ml. containers are more desirable.

Effect of Other Gases

Other investigators[20, 21, 22] have shown that gases such as carbon dioxide, ethylene, oxygen, hydrogen, methane, ethane, hydrogen sulphide, sulfur dioxide, water vapor, and formaldehyde can be completely removed by a purifying train consisting of concentrated sulphuric acid, chromic acid at 100° C. (212° F.) followed by suitable drying agents. Under such conditions no reaction with iodine pentoxide takes place due to the presence of the above gases.

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1. *Potassium Iodide Solution*—A solution of 4 per cent by weight of potassium iodide, as recommended by Davies & Hartley,[20] in freshly boiled and cooled distilled water is used. This solution should be kept away from the direct sunlight to prevent decomposition. A fresh solution should be made up each day and should show no trace of free iodine with starch indicator.

2. *Starch Indicator*—Potato starch has been used extensively and is quite suitable. However, tapioca starch has proved equally suitable in this laboratory. The concentration approximates two grams of starch per liter of solution. Chloroform to the amount of .2 per cent of the total volume of the solution is added as a preservative, and there is no need for making up a fresh starch solution each day. The tapioca is brought to boiling in distilled water while stirring and kept boiling for a few minutes. It is then diluted to the proper volume and allowed to settle. The clear supernatant liquid is syphoned off and the proper amount of chloroform added. When the iodine solution to be titrated is rather concentrated, it is best not to add the starch until a good share of the iodine color has been destroyed with the thiosulfate.

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4. *Chromic Acid*—This solution is made by saturating concentrated sulphuric acid with potassium dichromate.

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$$.000127 \text{ gms. } I_2 = \frac{.000127 \times 140}{253.8} = .00007 \text{ Gms. CO}$$

1 cc. of CO at 0° C. and 30″ Hg. = .00125 gms.

$$\text{Therefore 1 cc. .001 N } Na_2S_2O_3 = \frac{.00007}{.00125} = .056 \text{ cc. of CO at 0° C. and 30″ Hg.}$$

$$\text{or 1 cc. .001 N } Na_2S_2O_3 = .056 \times \frac{288.5}{273} = .059 \text{ cc. of CO at 60° F. and 30″ Hg.}$$

Using a 500 cc. sample, 1 cc. of .001 N $Na_2S_2O_3$ would be equal to $.059 \times \frac{10^6}{500}$ or 118 parts per million of carbon monoxide at 60° F. and 30 inches of mercury. If we assume a titration of 2.55 cc. of exactly .001 N $Na_2S_2O_3$, the resultant carbon monoxide concentration would be $2.55 \times 118 = 300$ parts per million of .03 per cent.

tube to a temperature of 205-215° C. for about two days while air or nitrogen was being drawn through it at the normal rate. At this temperature the unstable compounds are decomposed and removed from the system. The temperature is then dropped to 150° C. and purging continued for another two days at the end of which time the iodine pentoxide will usually be ready for use. Provision is made on the apparatus, at the lower end of the trap on the left side of the carrying box, for connecting carbon monoxide free air or nitrogen directly to the system for the conditioning of the iodine pentoxide. The air or nitrogen is allowed to pass through the purifying train before it reaches the iodine pentoxide tube. The outlet of the iodine pentoxide tube is open to the atmosphere during this purging procedure. The circulating pump is not used during this process.

The iodine pentoxide U-tube[7] in the present apparatus has been in use for nine years and has given no trouble. We expect the tube to last a good many more years.

(Arrangements have been made to supply the portable iodine pentoxide apparatus through the Will Corporation, Rochester. Address all inquiries to the Will Corporation, 39-51 Russell Street, Rochester 3, New York.)

Acknowledgment

The author wishes to acknowledge the cooperation and assistance of members of the laboratory staff and in particular R. W. Gilkinson, J. F. Thompson, and J. S. Yeaw in the development and checking of the apparatus.

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GAS COOLING NOTE

(From the *New Yorker,* Nov. 20)

Here's London Terrace, in New York City, the world's largest apartment house . . . and here, in every one of the 1,669 superbly modern kitchens, you will find 1,669 Servel Electrolux refrigerators.

—*From an advertising folder.*

Seems overdone, somehow.

Statement of the Ownership, Management, Circulation, Etc., Required By the Acts of Congress of August 24, 1912, and March 3, 1933

Of American Gas Association Monthly published monthly, except July-Aug. which is combined, at Brattleboro, Vermont for October 1, 1943.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared James M. Beall, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Gas Association, Inc., 420 Lexington Ave., 17, New York, N. Y.; Editor, James M. Beall, 420 Lexington Ave., New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

American Gas Association, Inc., 420 Lexington Ave., New York 17, N. Y.; President, Arthur F. Bridge; Vice-President, Ernest R. Acker; Treasurer, J. L. Llewellyn; Managing Director, Alexander Forward (all of 420 Lexington Ave., New York, N. Y.)

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is . (This information is required from daily publications only.)

JAMES M. BEALL, Editor.

Sworn to and subscribed before me this 20th day of September, 1943.

(Seal)

LAWRENCE P. BROWN,
Notary Public, Queens Co. No. 226, Reg. No. 110-B-5
Cert. filed in N. Y. Co. No. 135, Reg. No. 80-B-5
Commission expires March 30, 1945

(Continued from page 506)

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$$\text{Therefore 1 cc. .001 N } Na_2S_2O_3 = \frac{.00007}{.00125} = .056 \text{ cc. of CO at 0° C. and 30″ Hg.}$$

$$\text{or 1 cc. .001 N } Na_2S_2O_3 = .056 \times \frac{288.5}{273} = .059 \text{ cc. of CO at 60° F. and 30″ Hg.}$$

Using a 500 cc. sample, 1 cc. of .001 N $Na_2S_2O_3$ would be equal to $.059 \times \frac{10^6}{500}$ or 118 parts per million of carbon monoxide at 60° F. and 30 inches of mercury. If we assume a titration of 2.55 cc. of exactly .001 N $Na_2S_2O_3$, the resultant carbon monoxide concentration would be 2.55 × 118 = 300 parts per million of .03 per cent.

tube to a temperature of 205-215° C. for about two days while air or nitrogen was being drawn through it at the normal rate. At this temperature the unstable compounds are decomposed and removed from the system. The temperature is then dropped to 150° C. and purging continued for another two days at the end of which time the iodine pentoxide will usually be ready for use. Provision is made on the apparatus, at the lower end of the trap on the left side of the carrying box, for connecting carbon monoxide free air or nitrogen directly to the system for the conditioning of the iodine pentoxide. The air or nitrogen is allowed to pass through the purifying train before it reaches the iodine pentoxide tube. The outlet of the iodine pentoxide tube is open to the atmosphere during this purging procedure. The circulating pump is not used during this process.

The iodine pentoxide U-tube[7] in the present apparatus has been in use for nine years and has given no trouble. We expect the tube to last a good many more years.

(Arrangements have been made to supply the portable iodine pentoxide apparatus through the Will Corporation, Rochester. Address all inquiries to the Will Corporation, 39-51 Russell Street, Rochester 3, New York.)

Acknowledgment

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GAS COOLING NOTE

(From the *New Yorker*, Nov. 20)

Here's London Terrace, in New York City, the world's largest apartment house . . . and here, in every one of the 1,669 superbly modern kitchens, you will find 1,669 Servel Electrolux refrigerators.

—*From an advertising folder.*

Seems overdone, somehow.

Statement of the Ownership, Management, Circulation, Etc., Required By the Acts of Congress of August 24, 1912, and March 3, 1933

Of American Gas Association Monthly published monthly, except July-Aug. which is combined, at Brattleboro, Vermont for October 1, 1943.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared James M. Beall, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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Sworn to and subscribed before me this 20th day of September, 1943.

(Seal)

LAWRENCE P. BROWN,
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Commission expires March 30, 1945

War I Shell Material Makes Good Pipeline

MATERIAL that was originally fabricated to hurl death and destruction at the Hun during the last war has been doing a useful job for the last 24 years bringing health and happiness to many thousand American people.

This is the interesting story behind a routine job of pipe reconditioning now being carried on out in the Eastern Division of the Southern California Gas Company. The pipeline involved is a portion of the transmission line between Riverside and Colton.

Back in 1919, it is learned from H. P. George, manager of production and transmission, a firm that had been manufacturing shell casings found itself with a large quantity of the material on its hands. To get rid of it, the company offered it for sale at a greatly reduced price, and Southern California seized the opportunity to pick up several miles of perfectly serviceable piping at a comparatively small cost.

The casing material had a much thinner wall than ordinary pipe—only .2 inches—and it was an odd size—7⅝ inches in diameter. Nevertheless it was installed as part of the Riverside-Colton line and has been rendering service ever since.

Uncovered for reconditioning as part of the regular program now being carried on over the system, the line is found to be in good condition. After being machine cleaned, it is coated with no-oxide grease, then tarred and wrapped; and it is felt it will continue to give a good account of itself long after the present war.

SUPERVISORY TRAINING

(Continued from page 512)

Get All the Facts

Fit the facts together.
Consider their bearing on each other.
Check policies and practices.
Check with your supervisor if necessary.
Consider all possible decisions.
Consider their effect on the individual, and on other employees.

Make or Get a Decision

Notify him *promptly* of the decision.
When you tell him—sell him.
Don't pass the buck.

WHEN REPRIMANDING AN EMPLOYEE

Keep Cool

Avoid any prejudice.
Discuss the matter in private.
Watch your tone of voice.

Be Sure that the Reprimand or Criticism is Deserved

Be sure to get the employee's point of view.
Get at the core of the difficulty.
Could misunderstood orders, unreasonable demands, faulty equipment, be the source of the trouble?

Show the Employee How to Improve

Make clear how he can improve his work.
Reinstruct in duties as necessary.

Assure the Employee of your Personal Interest in *His Improvement*

Prove it by a friendly follow-up—soon.

GOOD PERSONNEL RELATIONS DEPEND UPON GOOD PERSONAL RELATIONS

Of course, there is no assurance that because a supervisor has taken a training course and carries around a summary of principles in a small vest pocket edition, he will automatically do an excellent employee relations job, but surely he will be a better supervisor for this experience.

This training course in supervisory job relations has been a lesson to us that there was an existing need for training, which we assumed when the course was planned and which was more than proved by our experience. Weaknesses were revealed of which we had not been fully aware. The presence of some ingrained ideas was apparent in the discussion periods. Sometimes individual or minority viewpoints were expressed that were very definitely in need of correction. On the whole, however, we gained confidence that a guided group judgment will be sound in principle and practical in application. We have determined that further supervisory training along this line is desirable and we have proved that it will be accepted and appreciated by the supervisors themselves. Wherever human relations are involved and they are certainly involved in supervision, we have not learned all there is to learn.

We feel that this first training has been successful if it has only achieved the purpose of selling the supervisors on training, making some of them more pliable and less cocksure about the rightness of their present methods, and has created an open mind to new ideas. For this is an achievement that will be reflected not only in employee relations but in other aspects of the supervisor's job.

WHO WILL SELL WHAT?

(Continued from page 516)

not be a serviceable member of the family which sells appliances through which our gas is burned and load put on our lines, which is, as I understand it, what we are trying to accomplish: or have some of us fallen completely in love with the idea of selling all or most of the gas appliances ourselves?

It seems to me that our Post-War Committees should continue their study in this direction and earnestly attempt to solve these merchandising problems which, unanswered and uncontrolled in the past, have cost us good-will, prestige, money and good business. When victory comes, it will be too late to jump into this job and proceed on a helter-skelter basis. *Now* is the time to make our plans and put our organization on paper, at least. At this stage of the game we can carefully analyze possibilities, set down working policies, lay out operating plans and bring them up for review, piece by piece, calmly, sensibly and unhurriedly. Only in so doing will we be prepared for an efficient, effective conversion to peacetime economy.

One more word: If we of the gas industry are fully prepared to step forward when the war is won, in full cooperation with individual dealers, large and small,—if we can see that far beyond our noses—the threat of government competition will be minimized, for all the government bureaus in the world cannot out-design, outproduce and under-price the management and brains available in the ranks of American business under the system of free enterprise by which our nation has grown great.

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SERVICES OFFERED

Petroleum Engineer, geologist, economist, 25 years' experience, available fee, salary or contract basis. Preferred locations: California, West generally, Latin America. **1468.**

Production superintendent, general superintendent, or preferably as manager of medium size gas property, either coal or water gas. Experience covers sixteen years' operating and eight years' management with successful record. Middle age. Prefer location in South. **1469.**

Industrial Relations Director. Mechanical Engineer with well rounded experience in production, heating engineering, sales, sales management, employment, personnel, and industrial relations management. Suitable for manufacturer or large operating properties. **1470.**

Gas Engineer, technical graduate, beyond draft age, with thirty years' experience in all phases of water gas production and high and low pressure distribution, desires connection with gas company. All experience with one holding company or subsidiaries. Present position being abolished and activities being curtailed in the system. **1471.**

Chemist—graduate, draft exempt; broad gas company laboratory experience in raw material, plant operation and byproduct control. Could be very useful to manufacturer on purchased supplies. **1472.**

Promotional man with ten years' gas industry training. Five years large Metropolitan gas company; five with domestic appliance manufacturer promotional selling and dealer developing. Have planned advertising activities—extensive writing experience. Now in war plant on management detail work. Can relieve busy executive or handle alone varied responsibilities. Draft 3-A. **1473.**

Executive-Engineer—Technically trained; widely experienced in: Production, transmission and distribution of natural, mixed and manufactured gas; electrical generation, transmission and distribution; design, construction and maintenance; purchasing, traffic, and sales engineering wishes to join progressive organization where merit, results and profits are foremost. **1474.**

15 years' broad experience manufacturing gas—specialized in low pressure and high pressure transmission and distribution—Inventory—appraisal—accident prevention—now active duty U. S. Navy—Commander U.S.N.R. Long range planning to future **Post War connection** medium size property—location immaterial—Married with family. (43) **1475.**

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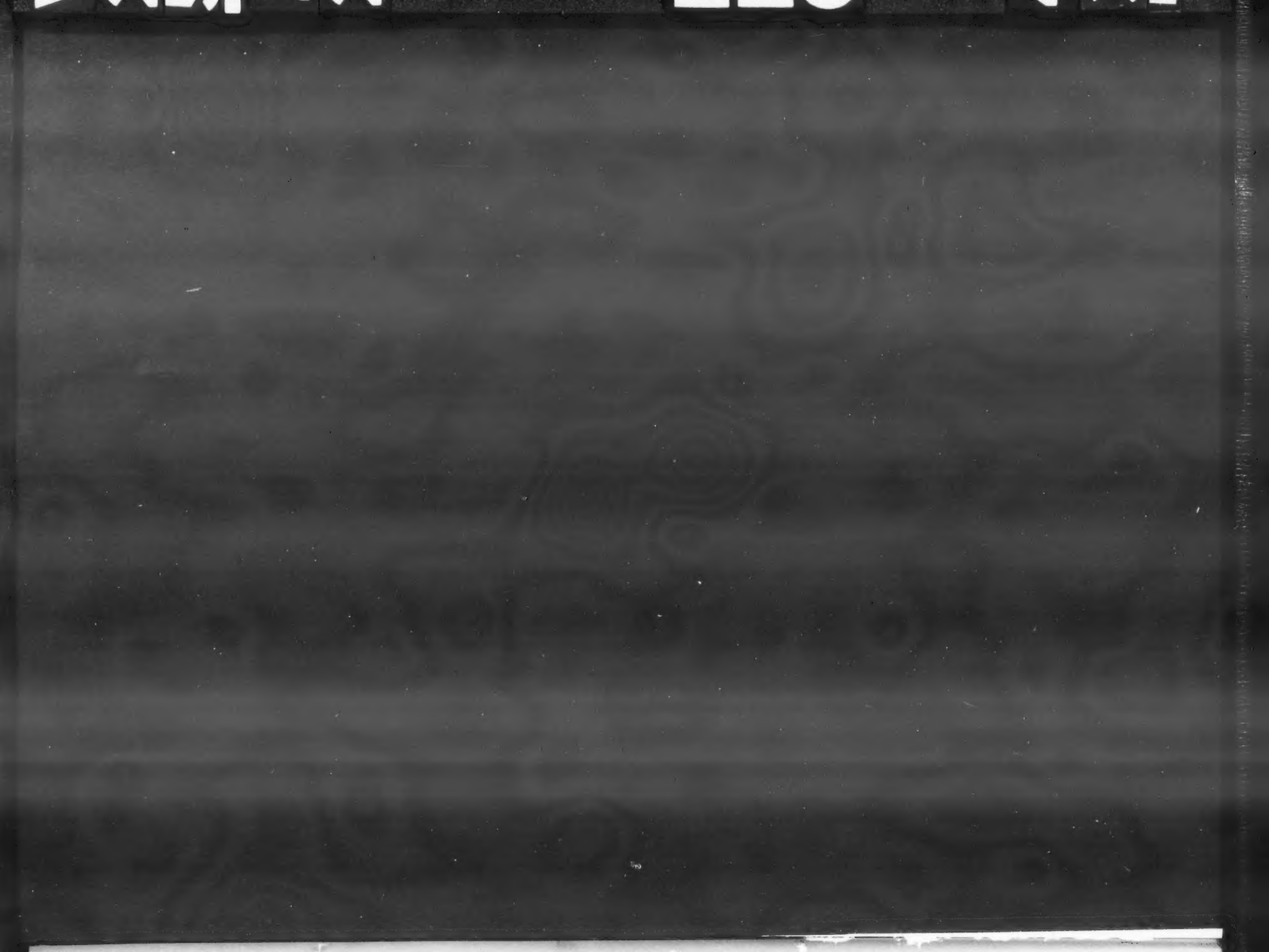
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